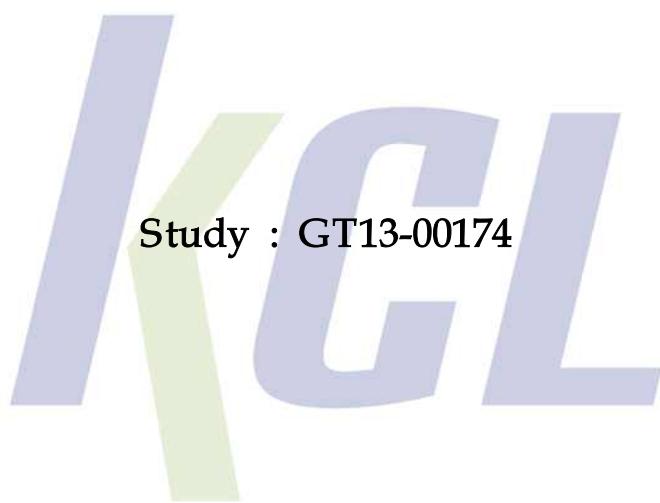


Final Report

Subacute Inhalation Toxicity Study of
MWCNT in Fisher 344



November 2014



BioConvergence Technology Laboratory

Statement

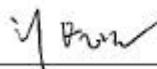
Study code : GT13-00174

Title : Subacute Inhalation Toxicity Study of MWCNT in Fisher 344

This study has been performed in compliance with the principles of Good Laboratory Practices and test guidelines in following documents.

1. Guideline for the Testing of Chemical Hazards, National Institute of Environment Research (NIER)[Notice No. 2013-2 (revised 9th, Jan., 2013)]
2. Standards of Good Laboratory Practice, National Institute of Environment Research (NIER)[Notice No. 2013-1 (revised 9th, Jan., 2013)]
3. OECD Guidelines for the Testing of Chemical No. 412 'Subacute Inhalation Toxicity: 28-Day Study'(Adopted 7th Sep, 2009)

The stated object in the study protocol was achieved and there were no significant deviations from the aforementioned regulations that affected the quality or integrity of the study. Therefore, the justification of all data in this study was confirmed. The information of the test substance was written from the document that the sponsor provided.



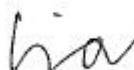
Nov. 19, 2014

Byung-Gil Choi

Date

Study Director

BioConvergence Technology Laboratory



Nov. 19. 2014

Jin-Kyu Lee

Date

Managing Director

BioConvergence Technology Laboratory

QUALITY ASSURANCE STATEMENT

Study No. : GT13-00174

Title : Subacute Inhalation Toxicity Study of MWCNT in Fisher 344

This study was subject to audit by the independent Quality Assurance Unit of KCL as indicated below. The findings of each audit were reported to the study director and management as prescribed by Standard Operating Procedures.

The final report audit was designed to confirm that as far as can be reasonably established the methods described and results incorporated in the final report accurately reflect the raw data produced during the study.

Audit phases and dates reported to the responsible personnel were as indicated below and these were based upon the audit records.

Phase Inspected	Date	Reports to Study Director	Reports to Management
Study Plan	2013. 05. 23	2013. 05. 23	2013. 05. 23
Animal receipt	2013. 05. 30	2013. 05. 30	2013. 05. 30
Storage of Test substance and vehicle	2013. 05. 30	2013. 05. 30	2013. 05. 30
Preparation of test substance	2013. 06. 11	2013. 06. 11	2013. 06. 11
	2013. 06. 25	2013. 06. 25	2013. 06. 25
Animal care and Administration	2013. 06. 11	2013. 06. 11	2013. 06. 11
	2013. 06. 25	2013. 06. 25	2013. 06. 25
Clinical sign	2013. 06. 11	2013. 06. 11	2013. 06. 11
	2013. 06. 25	2013. 06. 25	2013. 06. 25
Ophthalmoscopy and urinalysis	2013. 06. 30	2013. 06. 30	2013. 06. 30
Necropsy and clinical pathology	2013. 07. 03	2013. 07. 03	2013. 07. 03
	2013. 07. 04	2013. 07. 04	2013. 07. 04

Preparation of specimen and Observation	2013. 07. 22	2013. 07. 22	2013. 07. 22
	2013. 08. 12	2013. 08. 12	2013. 08. 16
Raw data	2013. 10. 28	2013. 10. 28	2013. 10. 28
Final Report	2013. 10. 28	2013. 10. 28	2013. 10. 28

QA director : Song, Kyung Seuk Ph.D. Date 2013. 10. 28
 Auditor, Quality Assurance

* signed original

Study Personnel

Principal Investigator Jae-Hyuck Sung* **Date** 28 October 2013

Formulation Jae-Hyuck Sung* **Date** 28 October 2013

Animal care Min-Won Baek* **Date** 28 October 2013

Necropsy & Pathology Hye-Jin Kim* **Date** 28 October 2013

Archiving Hyo-Dong Kim* **Date** 28 October 2013

* Signed original

Title	Subacute Inhalation Toxicity Study of MWCNT in Fisher 344		
Objective of Study	The purpose of this study is to evaluate repeated dose inhalation toxicity in SPF-F344 rats after nose-only exposure to MWCNT with 6 hours/day, 5 days/week and 28 days.		
Sponsor	Name : Bioconvergence Technology Laboratory Korea Conformity Laboratories	Client : Jin-Kyu Lee	Address : 7-44, Songdo-dong, Yeonsu-gu, Incheon, 406-840, Korea
	Tel. : +82-32-859-4041	Fax : +82-32-858-0020	
Testing facility	Name : Bioconvergence Technology Laboratory Korea Conformity Laboratories	Address : 7-44, Songdo-dong, Yeonsu-gu, Incheon, 406-840, Korea	Tel. : +82-32-859-4050
	Fax : +82-32-858-0020		
Study Schedule	Approval of test protocol : 23 May 2013	Animal acquisition : 30 May 2013	
	Initiation of exposure : 05 June 2013 (Male)	06 June 2013 (Female)	
	Termination of exposure : 02 July 2013 (Male)	03 July 2013 (Female)	
	Necropsy : 03 July 2013 (Male)	04 July 2013 (Female)	
	Submission of pathologic report : 12 September 2013		
	Submission of final report : 28 October 2013		
Archiving of study data	1) Archiving period : Least 5 years after the study termination 2) Data : Study protocol, test substance data, animal acquisition data, raw data, GLP documents 3) Storage room <ul style="list-style-type: none"> (1) Archive 1 : CD and relevant documents (2) Archive 2 : Specimens and slides 		

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1. SUMMARY

This study was performed to evaluate acute inhalation toxicity of multi-wall carbon nanotube (MWCNT) using specific pathogen free (SPF) - Fisher 344 (F344) rats with the concentration of 0, 0.2 (low-dose group), 0.5 (middle-dose group) and 1.0 (high-dose group) mg/m³. The rats were exposed to test substance for 6 hours/day, 5 days/week, for 28-day in nose-only inhalation chamber. Grouping consisted of 5 male and female rats in each group. Test method conformed to Guideline for the Testing of Chemical Hazards, National Institute of Environment Research (NIER)[Notice No. 2013-2 (revised 9th, Jan., 2013)] and OECD Guideline for Testing of Chemicals No. 412 'Subacute Inhalation Toxicity' (Adopted 7th Sep, 2009).

Environment and the concentration of MWCNT in exposure chamber were measured for the duration of exposure time. During the study, mortalities, clinical signs, body weight changes, food consumption, ophthalmoscopy, urinalysis, hematology, blood coagulation time, blood biochemistry, organ weights, gross finding and histopathological findings were examined.

The results were as follows,

- (1) The temperature, humidity, oxygen, carbon dioxide (CO₂) and pressure for the exposure period were recorded as 23.49±0.13 °C, 43.19±0.35 %, 20.06±0.00 %, 345.32±3.47 ppm, -280.27±1.81 pascal in Chamber 1 (control), and 22.99±0.14 °C, 47.73±0.59 %, 20.50±0.00 %, 360.24±2.98 ppm, -287.65±1.81 pascal in Chamber 2 (low dose group). Chamber 3 (middle dose group) was recorded as 22.89±0.11 °C, 53.92±0.28 %, 20.18±0.01 %, 358.38±3.12 ppm, -283.11±2.30 pascal, and Chamber 4 (high dose group) was recorded as 22.27±0.13 °C, 58.07±0.32 %, 20.26±0.01 %, 356.80±4.68 ppm, -284.81±2.03 pascal.
- (2) The mass concentration of test substance was recorded as 0.17±0.0003 mg/m³, 0.51±0.001 mg/m³, 0.97±0.02 mg/m³ for low, middle and high dose respectively. The particle number of clean air entering the control chamber was 0.032±0.001 particles/cm³ in Channel 1 and 0.006±0.0004 particles/cm³ in Channel 2 of the particle sensor.
- (3) The results of TEM analysis, the shape was shown as fiber shape, and the main element was carbon through the analysis of energy dispersive X-ray spectrometer (EDX). Geometric mean (GM) and geometric standard

deviation (GSD) of the cumulative median length (CML) were [REDACTED] nm and [REDACTED], respectively.

- (4) No toxic signs or mortality were observed relating to the test substance.
- (5) There was no significant difference in body weight change between control and exposure groups for male and female rats.
- (6) No distinct effects were observed during the 28-day exposure period, and there were no significant differences in food consumption between the male rats and the control group. For the female rats, the high-dose group showed an increased food consumption ($p<0.01$) at 4 wk compared with the control and low-dose groups, however, the medium-dose group showed no significant change in food consumption during the exposure period.
- (7) In urinalysis, there were no significant differences related with the test substance for all treated groups.
- (8) In necropsy, no abnormal lesions related with the test substance were observed in all animals.
- (9) In organ weights, there were no significant differences related with the test substance for all treated groups.
- (11) In hematology, blood coagulation time and blood biochemistry, there were no significant differences related with the test substance for all treated groups.
- (12) In histopathological examination, findings related with the test substance were not observed.

In conclusion, exposure to MWCNT for the 28-day did not appear to have any significant health effects in the rats in this study.

2. TEST SUBSTANCE AND VEHICLE

1) Test substance (Annex 1)

- (1) Name : MWCNT
- (2) Product Name : K-Nanos-100P
- (3) Lot No. : No data
- (4) Received date : 25 January 2013
- (5) Received quantity : 666.89 g (including a container weight)
- (6) Appearance : Black powder
- (7) Purity : Carbon content > 90 %
- (8) Storage condition : Ambient room temperature and humidity
- (9) Stability : Stable under refrigeration
- (10) Handling : Stable under refrigeration
- (11) Supplier : Kumho petrochemical Co., Ltd.

2) Vehicle

- (1) Name : HEPA filtered fresh air

3) Storage and Treatment

The test substance was kept in a storage room (108-2). At completion of the study, the remaining test substance was kept in a storage room (108-3).

4) Formulation of the test solution

The mixture of test substance and fresh air was used after maintain a constant temperature and pressure using the carbon nanotube (CNT) generator (CNT generator, HCT, Korea; MAI-099-02).

3. MATERIALS AND METHODS

1) Test animals

- (1) Species and strains : Specific Pathogen Free(SPF) Fisher 344 rats
(F344/N Slc)
- (2) Supplier : Central Lab. Animal Inc.
(5F Eun-seok B/D, 64, Umyeon-dong, Seocho-gu, Seoul, Korea)
- (3) Producer : Japan SLC, Inc.

(3371-8 Kotoh-cho, Hamamatsu, Shizuoka Prefecture 431-1103)

(4) Reason for selection of the species

The animals used in this study, F344 rats, have been applied widely in general toxicity tests as a suitable experimental animal for toxicity testing. In addition, sufficient raw data have been accumulated, and such data are available in interpretation and evaluation of study results.

(5) Date of acquisition : 30 May 2013

(6) Number of animals received

① Male : 44

② Female : 44

(7) Age of animals received : 7 weeks

(8) Body weights on arrival (mean±S.E)

① male : 126.57 ± 0.90 g

② female : 116.61 ± 0.94 g

(9) Quarantine and acclimation

Animal observation performed on date of acquisition. Microorganism test result was obtained from supplier. Acclimation duration was more than 5 days. Only the most healthy animals were used for study after observing general conditions in the acclimation period. (Annex 2)

(10) Age at the initiation of the exposure : 8 weeks

(11) Body weights at the exposure (mean±S.E)

① male : 165.85 ± 0.94 g

② female : 138.17 ± 0.79 g

(12) Number of animals used : female 40, male 40

(13) Grouping

The animals were stratified randomly by body weight after measuring body weight one day before initiation of exposure.

(14) Identification of individual animals

To distinguish animals, skin marking (blue marking during acclimation and black marking during main study) was used. Cage card was used for each cage and the animal use log was posted at the entrance of animal room with indication of study number, title, duration of use, name of study director, and name of study personnel.

(15) Handling of remaining animal

Remaining animals sacrificed at the planned date.

(16) Compliance with the guidelines of animal ethics

This study was approved by the IACUC of Korea Conformity Laboratory

(approval number : IA13-00356)).

2) Environmental and Housing Condition (Annex 3)

(1) Animal care room

① Acclimation period : Animal care room in inhalation toxicity room

② Exposure period : Inhalation toxicity room #1

(2) Range of temperature and humidity

① Acclimation period : 21.2 ± 0.6 °C of temperature, 55.9 ± 3.4 %RH of relative humidity

② Exposure period : 22.9 ± 2.0 °C of temperature, 48.7 ± 3.2 %RH of relative humidity

(3) Lighting cycle : 12 hrs of lighting duration

(lighting up at 8 a.m. ~ lighting out at 8 p.m.)

(4) Lighting intensity

① Acclimation period : 276 Lux

② Exposure period : 272 Lux

(5) Ambient noise level

① Acclimation period : 48.1 dB

② Exposure period : 55.1 dB

(6) Ammonia concentration

① Acclimation period : less than 5 ppm

② Exposure period : less than 5 ppm

(7) Housing

The 5 animals were housed in polycarbonate cage (500 L×306 W×200 H mm) during quarantine and acclimation period. And the 1 animal was housed in wire 5-mesh cages (800 W×200 D×150 H mm) during exposure periods.

(8) Feeds and water

① Feeds

Radiation sterilized, solid laboratory animal feeds (Teklad Certified Irradiated Global 18 % Protein Rodent Diet, Harlan Co. Ltd., USA) were provided *ad libitum*. DooYeol Biotech Co., Ltd. supplied feeds.

② Water

Incheon, Korea municipal tap water purified by reverse osmosis filtering system was provided *ad libitum* using water bottles.

③ Certification

The feed certification which was provided from the supplier and the water certification from national certificated inspection organization were referred to

examine contamination (Annex 4, 5).

3) Methods

(1) Exposure method

- ① Route : Inhalation (nose-only)
- ② Reason : Inhalation is a major route for MWCNT exposure.
- ③ Exposure frequency and duration : 6 hours/day, 5 days/week, 28 days
- ④ Exposure location : mainly respiratory system

(2) Dose group and target concentration

Test substance	Group	Mass (mg/m ³)	Sex	N	Animal No.
MWCNT	Control	0	M	10	1-10
			F	10	41-50
	Low	0.2±30 %	M	10	11-20
			F	10	51-60
	Medium	0.5±30 %	M	10	21-30
			F	10	61-70
	High	1.0±30 %	M	10	31-40
			F	10	71-80

M; Male, F; Female

(3) Justification for dose setting

In the acute inhalation toxicity study (GT13-00173), no toxic signs were observed relating to the test substance. Therefore, the maximal mass concentration capacity for the CNT generating system was used to generate the high dose exposure in this study, and set the low and middle concentration with the ten multiple of high dose.

(4) Test items

① Measurement of environment inside animal exposure chamber

Temperature, humidity, pressure, oxygen (O₂) and carbon dioxide (CO₂) were measured automatically using inhalation toxicity monitoring system at main control center for duration of exposure period.

② Generating method for MWCNT

MWCNT were generated as shown in Figure 1. It was used that the CNT generator and nose-only inhalation toxicity chamber (NITC 30, HCT, Korea; MAI-114-01).

③ Distribution of MWCNT in exposure chamber

Mass concentration was measured with the NIOSH method 0500 using the

personal air sampler and polyvinylidene fluoride membrane filter.

④ Transmission Electron Microscopy (TEM) analysis

The TEM sample, which was collected with nanoparticle collector, was requested for analysis of MWCNT shape.

⑤ Clinical signs

General clinical signs of all treated animals were observed once a day after administration during the exposure period. Individual records were maintained for each animal including the mortality, type, date and grade of clinical signs.

⑥ Body weight

Individual animal weight was recorded at acquisition, grouping, at the before exposure, once a week during the study and before necropsy.

⑦ Food consumption

Food consumption was measured once a week during the exposure periods and calculated with the difference between feed ration and residual quantity of food. The value was calculated the average consumption (g/rat/day) of the individual animals.

⑧ Urinalysis

Urine samples were collected from 5 animals in each group using metabolic cages on the last week of exposure period. The urine samples were analyzed for below inspection items using urine test strips (SIEMENS) and the Urine auto-analyzer (CliniTek 50, SIEMENS, Germany; MAI-050-01).

Urinalysis	
Glucose	Urobilinogen
Bilirubin	Nitrite
Ketone body	Leukocyte
Specific gravity	Protein
Occult blood	pH

⑨ Necropsy

After the exposure, necropsy was conducted all surviving animals and animals were anesthetized with dose of 1 ml/kg pentobarbital(entobal®, Hanlim Pharm. co. Ltd.) by the injection via abdominal cavity. Blood was then drawn from the abdominal aorta, and gross findings were conducted in the subcutaneous, abdominal cavity, thoracic cavity organs and brain.

⑩ Organ weights measurement

At necropsy, the weights of below organs were measured using electric

balance.

Organ weights
Testis, Ovary, Spleen, Liver, Thymus, Adrenal gland, Kidney, Heart, Lung, Brain, Pituitary, Olfactory bulb

⑪ Blood biochemistry

The blood biochemistry was conducted with serum using the biochemistry analyzer (Hitachi7180, HITACHI, Japan; MAI-059-01). The serum was took from centrifuging blood (3,000 rpm, 10 min) collected from the abdominal aorta at necropsy. Inspection items is below.

Blood biochemistry	
AST (Aspartate aminotransferase)	CPK (Creatine phosphokinase)
ALT (Alanine aminotransferase)	ALB (Albumin)
ALP (Alkaline phosphatase)	T-BIL (Total bilirubin)
GGT (Gamma(γ)-glutamyl transferase)	A/G ratio
LDH (Lactate dehydrogenase)	TG (Triglyceride)
BUN (Blood urea nitrogen)	UA (Uric acid)
CRE (Creatinine)	Ca (Calcium)
GLU (Glucose)	IP (Inorganic phosphorus)
CHO (Total cholesterol)	Cl (Chloride)
HDL (High density lipoprotein)	Mg (Magnesium)
LDL (Low density lipoprotein)	Na (Sodium)
TP (Total protein)	K (Potassium)

⑫ Hematology

The blood was analyzed using the Hematology Analyzer (ADVIA 2120, SIEMENS, Germany; MAI-105-01), and collected in EDTA-2K vacutainers. Inspection items is below.

Hematology	
WBC (White blood cell count)	RDW (Red cell distribution width)
RBC (Red blood cell count)	PLT (Platelet)
Hb (Hemoglobin conc.)	MPV (Mean Platelet Volume)
HCT (Hematocrit)	WBC differential count
MCV (Mean corpuscular volume)	LUC (Large unstained cells)
MCH (Mean corpuscular hemoglobin)	Reti (Reticulocyte)
MCHC (Mean corpuscular hemoglobin conc.)	

⑬ Blood coagulation test

The blood coagulation test was conducted to analyze PT (prothrombin time) and APTT (active partial thromboplastin time) using the blood coagulation analyzer (ACL7000, Instrumentation Laboratory, USA; MAI-076-01). The blood samples were collected from the abdominal aorta at necropsy and anticoagulated by 3.2 % sodium citrate solution.

⑭ Storage of organ and tissue

All organs and tissues as follows were fixed in 10% formalin solution containing neutral phosphate-buffered saline. However, testis were fixed in Böuin solution and eyes were fixed in Davidson's solution.

List of organs		
Brain	Parathyroid gland	Cecum
Pituitary gland	Adrenal gland	Colon
Heart	Esophagus	Rectum
Lung	Aorta	Femur
Liver	Spinal cord	Sternum
Kidney	Sciatic nerve	Trachea
Urinary bladder	Skeletal muscle	Tongue
Mesenteric lymph node	Skin	Prostate
Thymus	Mammary gland	Testes
Spleen	Eye	Epididymis
Pancreas	Stomach	Seminal vesicle
Salivary gland	Duodenum	Ovary
Submandibular lymph node	Jejunum	Uterus
Thyroid gland	Ileum	Vagina

⑮ Histopathological examination

Fixed organs of animals in vehicle control and high dose group were made into histology slides and then histopathological examination was conducted. In the case of the organ suspected as target organ, all of them in other groups were also examined. Additionally, tissues of animals with abnormal sign at necropsy were examined histopathologically.

(5) Statistical analysis

The differences among the vehicle control and the dosing groups were examined using the parametric multiple comparison procedures or non-parametric multiple comparison procedures. The occurrence rate was converted into percentage. SPSS for Windows version 12.0 software (SPSS,

Chicago, IL, U.S.A.) was used for analysis.

- ① Analysis of continuous data (body weights, food consumption, hematology, blood coagulation time, blood biochemistry, organ weights)

The statistical treatment was conducted to suppose the normality. The differences among the groups were examined and certificated the equal variance using the standard one-way analysis of variance (ANOVA). If these test showed statistical significance, the data was analyzed using the multiple comparison procedure (If the equal variance was admit, Duncan's test was applied and if the equal variance was not admit, Dunnett's test was applied.) comparing vehicle control group with the other experimental groups.

- ② Analysis of non-continuous data (urinalysis) : The data was converted by scale conversion and analyzed by Chi-squared analysis.

Specific Gravity		Glucose, Protein, Leukocyte, Ketone, Occult blood, Bilirubin		Nitrite		pH		Urobilinogen	
Data	Scale conversion	Data	Scale conversion	Data	Scale conversion	Data	Scale conversion	Data	Scale conversion
≤1.005	1	-(negative)	0	-(negative)	0	5.0	1	0.2	1
1.010	2	±(trace)	1	+ (positive)	1	5.5	2	1.0	2
1.015	3	1+	2			6.0	3	2.0	3
1.020	4	2+	3			6.5	4		
1.025	5	3+	4			7.0	5		
≥1.030	6					7.5	6		
						8.0	7		
						8.5	8		
						9.0	9		

- ③ Declaration of statistical results

The statistical results were specified in a mean and standard error (S.E). The diameter of MWCNT was specified in a geometric mean (GM) and geometric standard deviation (GSD).

4. RESULTS

1) Environment for animal exposure chamber (Table 1, Appendix 1)

The temperature, humidity, oxygen, carbon dioxide (CO_2) and pressure for the exposure period were recorded as 23.49 ± 0.13 °C, 43.19 ± 0.35 %, 20.06 ± 0.00 %, 345.32 ± 3.47 ppm, - 280.27 ± 1.81 pascal in Chamber 1 (control), and 22.99 ± 0.14

℃, 47.73 ± 0.59 %, 20.50 ± 0.00 %, 360.24 ± 2.98 ppm, - 287.65 ± 1.81 pascal in Chamber 2 (low dose group). Chamber 3 (middle dose group) was recorded as 22.89 ± 0.11 ℃, 53.92 ± 0.28 %, 20.18 ± 0.01 %, 358.38 ± 3.12 ppm, - 283.11 ± 2.30 pascal, and Chamber 4 (high dose group) was recorded as 22.27 ± 0.13 ℃, 58.07 ± 0.32 %, 20.26 ± 0.01 %, 356.80 ± 4.68 ppm, - 284.81 ± 2.03 pascal.

2) Distribution of MWCNT in exposure chamber

(Table 2, Figure 2 and Appendix 2)

The mass concentration of test substance was recorded as 0.17 ± 0.0003 mg/m³, 0.51 ± 0.001 mg/m³, 0.97 ± 0.02 mg/m³ for low, middle and high dose respectively. The particle number of clean air entering the control chamber was 0.032 ± 0.001 particles/cm³ in Channel 1 and 0.006 ± 0.0004 particles/cm³ in Channel 2 of the particle sensor

3) TEM analysis of test substance (Table 4 and Figure 3, 4)

In the results of TEM analysis, the shape was shown as fiber shape, and the main element was carbon through the analysis of energy dispersive X-ray spectrometer (EDX). Geometric mean (GM) and geometric standard deviation (GSD) of the cumulative median length (CML) were █ nm and █, respectively.

4) Clinical signs (Table 5-1, 5-2 and Appendix 5-1, 5-2)

There were no mortalities and specific clinical signs in the control and exposure groups in male rats. The one case of opacity of eyeball was detected in one animal (animal No. 47) of female control group, but there were no mortalities and specific clinical signs in other control and exposure groups in female rats.

5) Body weights (Table 6-1, 6-2, Figure 5 and Appendix 6-1, 6-2)

There were no significant changes of body weights in each male or female rats during exposure periods.

6) Food consumption (Table 7-1, 7-2, Figure 6 and Appendix 7-1, 7-2)

There were no significant changes of food consumption in male rats during exposure periods. Food consumptions of high-dose group in week 4 were significantly increased compared with control and the low-dose groups in female rats ($p < 0.01$). Except for that, there were no significant changes in other groups.

8) Urinalysis (Table 8-1, 8-2 and Appendix 8-1, 8-2)

There were no significant changes in other inspection items in each male or female rats.

10) Necropsy findings (Table 9-1, 9-2 and Appendix 9-1, 9-2)

The specific necropsy finding were not observed in male rats. The opacity as the necropsy findings of the female rat right eye revealed one case (animal No. 47) in the control group.

11) Organ weights (Table 10-1, 10-2, 11-1, 11-2 and Appendix 10-1, 10-2)

In absolute organ weights, the brain weight was decreased significantly in male rats in the high-dose group when compared with the low-dose group ($p<0.05$), and the pituitary gland weight was decreased significantly in male rats in the high-dose group when compared with the medium-dose group ($p<0.05$). There were no significant changes of absolute organ weights in female rats.

In relative organ weights, the right lung weight of control and the low-dose groups was significantly lower than that of the medium-dose group ($p<0.05$), and the pituitary gland weight of the medium-dose group was higher than that of control, the low and high-dose groups ($p<0.01$) in male rats. There were no significant changes of relative organ weights in female rats.

12) Blood biochemistry (Table 12-1, 12-2 and Appendix 11-1, 11-2)

In the results of blood biochemistry, the magnesium (MG) and potassium (K) increased significantly in male rats in the high-dose group when compared with control and the low-dose groups ($p<0.01$). The value of glucose (GLU) decreased significantly in male rats in the high-dose group when compared with control and the low-dose groups ($p<0.05$), and the ratio of albumin and glucose (A/G ratio) increased significantly in male rats in control group when compared with the low and high-dose groups ($p<0.05$).

There were no significant changes of blood biochemistry in female rats.

13) Hematology (Table 13-1, 13-2 and Appendix 12-1, 12-2)

There were no significant differences related with the test substance for all treated groups.

14) Blood coagulation test (Table 14-1, 14-2, Figure 7 and Appendix 13-1,

13-2)

There were no significant changes in all groups in each male or female rats.

15) Histopathology (Table 15-1, 15-2 and Appendix 14-1, 14-2)

(1) Animals with gross finding

The opacity of right eye in female rats in control group was correlated as lenticular degeneration, hyperplasia in lens epithelial and retinal atrophy.

(2) Kidney

There were observed to the eight and nine case with focal mineralization in outer stripe in control and the high-dose groups of female rats respectively. And the focal basophilic tubule in cortex was observed in control and the high-dose groups in male rats.

(3) Other organs and tissues

The focal hemorrhage in cortex of adrenal gland, ectopic thymus and ultimobranchial cyst in thymus, and focal accumulation in alveolar macrophage in lung were observed in control and exposure groups in each male or female rats.

5. DISCUSSION AND CONCLUSION

This study was performed to evaluate acute inhalation toxicity of multi-wall carbon nanotube (MWCNT) using specific pathogen free (SPF) – Fisher 344 (F344) rats with the concentration of 0, 0.2 (low-dose group), 0.5 (middle-dose group) and 1.0 (high-dose group) mg/m³. The rats were exposed to test substance for 6 hours/day, 5 days/week, for 28-day in nose-only inhalation chamber. Grouping consisted of 5 male and female rats in each group. Test method conformed to Guideline for the Testing of Chemical Hazards, National Institute of Environment Research (NIER)[Notice No. 2013-2 (revised 9th, Jan., 2013)] and OECD Guideline for Testing of Chemicals No. 412 'Subacute Inhalation Toxicity' (Adopted 7th Sep, 2009).

Environment and the concentration of MWCNT in exposure chamber were measured for the duration of exposure time. During the study, mortalities, clinical signs, body weight changes, food consumption, ophthalmoscopy, urinalysis, hematology, blood coagulation time, blood biochemistry, organ weights, gross finding and histopathological findings were examined.

The results were as follows,

The temperature, humidity, oxygen, carbon dioxide (CO₂) and pressure for the exposure period were recorded as 23.49±0.13 °C, 43.19±0.35 %, 20.06±0.00 %, 345.32±3.47 ppm, -280.27±1.81 pascal in Chamber 1 (control), and 22.99±0.14 °C, 47.73±0.59 %, 20.50±0.00 %, 360.24±2.98 ppm, -287.65±1.81 pascal in Chamber 2 (low dose group). Chamber 3 (middle dose group) was recorded as 22.89±0.11 °C, 53.92±0.28 %, 20.18±0.01 %, 358.38±3.12 ppm, -283.11±2.30 pascal, and Chamber 4 (high dose group) was recorded as 22.27±0.13 °C, 58.07±0.32 %, 20.26±0.01 %, 356.80±4.68 ppm, -284.81±2.03 pascal.

The mass concentration of test substance was recorded as 0.17±0.0003 mg/m³, 0.51±0.001 mg/m³, 0.97±0.02 mg/m³ for low, middle and high dose respectively. The particle number of clean air entering the control chamber was 0.032±0.001 particles/cm³ in Channel 1 and 0.006±0.0004 particles/cm³ in Channel 2 of the particle sensor.

The results of TEM analysis, the shape was shown as fiber shape, and the main element was carbon through the analysis of energy dispersive X-ray spectrometer (EDX). Geometric mean (GM) and geometric standard deviation

(GSD) of the cumulative median length (CML) were [REDACTED] nm and [REDACTED] respectively.

There were no mortalities and specific clinical signs in the control and exposure groups in male rats. The one case of opacity of eyeball was detected in one animal (animal No. 47) of female control group, but there were no mortalities and specific clinical signs in other control and exposure groups in female rats.

There was no significant difference in body weight change between control and exposure groups for male and female rats.

There were no significant changes of food consumption in male rats during exposure periods. For the female rats, the significant changes at week 4 were not statistically dose-dependant, and it was considered that test substance was not influenced the food consumption.

In urinalysis, there were no significant differences related with the test substance for all treated groups.

In the results of necropsy after exposure, the one case (animal No. 47) of opacity was observed in female rats in control group. Except for that, there were no abnormal gross findings in each male or female rats.

In the results of organ weights, the absolute and relative weight of pituitary gland increased significantly ($p<0.01$) in male rats in the medium-dose group when compared with control group. The relative weight of right lung increased significantly ($p<0.05$) in male rats in the medium-dose group when compared with control group. However, these values were not statistically dose-dependant, and it was considered that test substance was not influenced the change of organ weight. Except for that, there were no statistical difference in other organs in each male or female rats.

In the results of blood biochemistry, the high-dose group revealed significantly increased magnesium and potassium ($p<0.01$) in the male rats when compared with control group. The value of A/G ratio ($p<0.05$) in the low and high-dose group and the value of glucose ($p<0.05$) in the the high-dose group were

decreased significantly when compared with the male rats in control group. However, these values were comprised in physiological normal range and were not statistically dose-dependant, and it was considered that test substance was not influenced the blood biochemistry.

In the results of hematology, there were no significant differences related with the test substance in each male or female rats.

In the results of blood coagulation time, there were no significant differences related with the test substance for all treated groups.

In histopathological examination, opacity of right eye, gross finding of female control, correlated with lenticular degeneration, hyperplasia of lens epithelial and retinal atrophy. But, it is not considered to relate with test article, because those are observed in one animal of control group.

In the kidney, focal mineralization at outer stripe was observed in each 8, 9 animals of female control and the high-dose groups. But, it is not considered to relate with test article, because their incident rate was similar to that of the control group, and that lesion was not accompanied with other changes in kidney-relating test items. Besides, the reason was unclear, that lesion could be caused by food ingredients imbalance (calcium, phosphorus, etc.) in female rats. Also, there was focal basophilic tubules at kidney cortex in male control and the high-dose group. However it is not considered to be toxicological effects, because their incident rate was similar to that of the control group, and that lesion was considered to be spontaneous.

In conclusion, exposure to MWCNT for the 28-day did not appear to have any significant health effects in the rats in this study.

6. REFERENCES

- 1) Guideline for the Testing of Chemical Hazards, National Institute of Environment Research (NIER) [Notice No. 2013-2 (revised 9th, Jan., 2013)]
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7. TABLE

Table 1. Environment of animal exposure chamber

ENVIRONMENT OF ANIMAL EXPOSURE CHAMBER					
					Mean± S.E
Group	Temperature (°C)	Humidity (%)	O ₂ (%)	CO ₂ (ppm)	Pressure (pascal)
Control	23.49 ± 0.13	43.19 ± 0.35	20.06 ± 0.00	345.32 ± 3.47	-280.27 ± 1.81
Low	22.99 ± 0.14	47.73 ± 0.59	20.50 ± 0.00	360.24 ± 2.98	-287.65 ± 1.81
Medium	22.89 ± 0.11	53.92 ± 0.28	20.18 ± 0.01	358.38 ± 3.12	-283.11 ± 2.30
High	22.27 ± 0.13	58.07 ± 0.32	20.26 ± 0.01	356.80 ± 4.68	-284.81 ± 2.03

Table 2. Concentration of MWCNT

CONCENTRATION OF ANIMAL EXPOSURE CHAMBER				
STUDY : GT13-00174				
GROUP	Control	Low	Medium	High
Dose (mg/m ³)	0.00 ± 0.00 (42)	0.17 ± 0.0003 (42)	0.51 ± 0.001 (42)	0.97 ± 0.02 (42)
Dose (g/m ³)	0.00 ± 0.00 (42)	0.00 ± 0.0000 (42)	0.00 ± 0.000 (42)	0.00 ± 0.00 (42)

Table 3. Distribution of particle in vehicle

DISTRIBUTION OF PARTICLE IN VEHICLE				

Table 4. The length of MWCNT

THE LENGTH OF MWCNT				

Table 5-1. Clinical signs of male rats

CLINICAL SIGNS SUMMARY					
STUDY : GT13-00174		SEX: MALE			
Day	SIGN	Control	Group		
			Low	Medium	High
0	Normal	10/10	10/10	10/10	10/10
1	Normal	10/10	10/10	10/10	10/10
2	Normal	10/10	10/10	10/10	10/10
3	Normal	10/10	10/10	10/10	10/10
4	Normal	10/10	10/10	10/10	10/10
5	Normal	10/10	10/10	10/10	10/10
6	Normal	10/10	10/10	10/10	10/10
7	Normal	10/10	10/10	10/10	10/10
8	Normal	10/10	10/10	10/10	10/10
9	Normal	10/10	10/10	10/10	10/10
10	Normal	10/10	10/10	10/10	10/10
11	Normal	10/10	10/10	10/10	10/10
12	Normal	10/10	10/10	10/10	10/10
13	Normal	10/10	10/10	10/10	10/10
14	Normal	10/10	10/10	10/10	10/10
15	Normal	10/10	10/10	10/10	10/10
16	Normal	10/10	10/10	10/10	10/10
17	Normal	10/10	10/10	10/10	10/10
18	Normal	10/10	10/10	10/10	10/10
19	Normal	10/10	10/10	10/10	10/10
20	Normal	10/10	10/10	10/10	10/10

Table 5-1. Clinical signs of male rats (continued)

CLINICAL SIGNS SUMMARY						
STUDY : GT13-00174			SEX: MALE			
Day	SIGN		Group			
			Control	Low	Medium	High
21	Normal		10/10	10/10	10/10	10/10
22	Normal		10/10	10/10	10/10	10/10
23	Normal		10/10	10/10	10/10	10/10
24	Normal		10/10	10/10	10/10	10/10
25	Normal		10/10	10/10	10/10	10/10
26	Normal		10/10	10/10	10/10	10/10
27	Normal		10/10	10/10	10/10	10/10
28	Normal		10/10	10/10	10/10	10/10

Table 5-2. Clinical signs of female rats

CLINICAL SIGNS SUMMARY					
STUDY : GT13-00174		SEX: FEMALE			
Day	SIGN	Control	Group		
			Low	Medium	High
0	Normal	10/10	10/10	10/10	10/10
1	Normal	10/10	10/10	10/10	10/10
2	Normal	10/10	10/10	10/10	10/10
3	Normal	10/10	10/10	10/10	10/10
4	Normal	10/10	10/10	10/10	10/10
5	Normal	10/10	10/10	10/10	10/10
6	Normal	10/10	10/10	10/10	10/10
7	Normal	10/10	10/10	10/10	10/10
8	Normal	10/10	10/10	10/10	10/10
9	Normal	10/10	10/10	10/10	10/10
10	Normal	10/10	10/10	10/10	10/10
11	Normal	10/10	10/10	10/10	10/10
12	Normal	10/10	10/10	10/10	10/10
13	Normal	10/10	10/10	10/10	10/10
14	Normal	10/10	10/10	10/10	10/10
15	Normal	10/10	10/10	10/10	10/10
16	Normal	10/10	10/10	10/10	10/10
17	Normal	10/10	10/10	10/10	10/10
18	Normal	10/10	10/10	10/10	10/10
19	Normal	10/10	10/10	10/10	10/10
20	Normal	10/10	10/10	10/10	10/10

Table 5-2. Clinical signs of female rats (continued)

CLINICAL SIGNS SUMMARY					
STUDY : GT13-00174		SEX: FEMALE			
Day	SIGN	Control	Group		
			Low	Medium	High
21	Normal	10/10	10/10	10/10	10/10
22	Normal	10/10	10/10	10/10	10/10
23	Normal	9/10	10/10	10/10	10/10
	Opacity of eyeball	1/10	0/10	0/10	0/10
24	Normal	9/10	10/10	10/10	10/10
	Opacity of eyeball	1/10	0/10	0/10	0/10
25	Normal	9/10	10/10	10/10	10/10
	Opacity of eyeball	1/10	0/10	0/10	0/10
26	Normal	9/10	10/10	10/10	10/10
	Opacity of eyeball	1/10	0/10	0/10	0/10
27	Normal	9/10	10/10	10/10	10/10
	Opacity of eyeball	1/10	0/10	0/10	0/10
28	Normal	9/10	10/10	10/10	10/10
	Opacity of eyeball	1/10	0/10	0/10	0/10

Table 6-1. Body weights changes of male rats

SUMMARY OF BODY WEIGHTS						
STUDY : GT13-00174		UNIT : g			SEX : MALE	
GROUP: (mean±S.E)	Control	Low	Medium	High		
0 DAY	165.88 ± 2.05 (10)	165.86 ± 2.03 (10)	165.85 ± 1.95 (10)	165.86 ± 1.76 (10)		
1 Week	172.73 ± 2.50 (10)	172.86 ± 2.46 (10)	171.44 ± 2.30 (10)	170.24 ± 3.15 (10)		
2 Week	195.86 ± 2.67 (10)	198.34 ± 3.73 (10)	192.54 ± 2.75 (10)	196.68 ± 3.09 (10)		
3 Week	216.36 ± 2.87 (10)	218.85 ± 4.14 (10)	211.18 ± 3.30 (10)	215.15 ± 3.57 (10)		
4 Week	233.90 ± 2.69 (10)	236.18 ± 4.32 (10)	230.49 ± 4.30 (10)	233.92 ± 3.56 (10)		
Sacrifice	216.31 ± 2.92 (10)	217.72 ± 4.30 (10)	212.97 ± 3.99 (10)	214.65 ± 3.72 (10)		

() : animal number

Table 6-2. Body weights changes of female rats

SUMMARY OF BODY WEIGHTS						
STUDY : GT13-00174		UNIT : g			SEX : FEMALE	
GROUP: (mean±S.E)	Control	Low	Medium	High		
0 DAY	138.47 ± 1.96 (10)	137.79 ± 1.53 (10)	138.20 ± 1.56 (10)	138.22 ± 1.50 (10)		
1 Week	137.27 ± 2.55 (10)	137.53 ± 1.54 (10)	137.38 ± 1.69 (10)	136.80 ± 1.20 (10)		
2 Week	140.72 ± 2.56 (10)	141.26 ± 1.49 (10)	143.36 ± 2.27 (10)	141.32 ± 1.37 (10)		
3 Week	144.50 ± 1.86 (10)	143.66 ± 1.92 (10)	146.24 ± 2.54 (10)	144.09 ± 1.86 (10)		
4 Week	148.85 ± 1.55 (10)	146.02 ± 1.90 (10)	151.20 ± 3.01 (10)	148.96 ± 2.55 (10)		
Sacrifice	135.03 ± 1.57 (10)	131.66 ± 1.94 (10)	135.78 ± 2.58 (10)	134.12 ± 2.17 (10)		

() : animal number

Table 7-1. Food consumption of male rats

SUMMARY OF FOOD CONSUMPTION								
STUDY : GT13-00174		UNIT : g				SEX : MALE		
GROUP (mean±S.E)	Control	Low	Medium	High				
1 Week	17.58 ±0.62 (10)	18.06 ±0.58 (10)	17.86 ±0.47 (10)	14.99 ±1.64 (10)				
2 Week	17.22 ±0.41 (10)	18.31 ±0.72 (10)	17.51 ±0.77 (10)	18.58 ±0.43 (10)				
3 Week	17.94 ±0.29 (10)	18.77 ±0.64 (10)	17.73 ±0.41 (10)	18.32 ±0.65 (10)				
4 Week	17.10 ±0.32 (10)	18.42 ±0.48 (10)	18.61 ±0.77 (10)	18.90 ±0.40 (10)				

() : animal number

Table 7-2. Food consumption of female rats

SUMMARY OF FOOD CONSUMPTION								
STUDY : GT13-00174		UNIT : g				SEX : FEMALE		
GROUP (mean±S.E)	Control	Low	Medium	High				
1 Week	11.35 ±0.38 (10)	11.50 ±0.48 (10)	11.85 ±0.49 (10)	11.34 ±0.52 (10)				
2 Week	10.82 ±0.30 (10)	11.52 ±0.32 (10)	12.62 ±0.76 (10)	11.91 ±0.31 (10)				
3 Week	11.30 ±0.30 (10)	10.90 ±0.40 (10)	9.81 ±1.40 (10)	10.88 ±0.35 (10)				
4 Week	10.49 ±0.26 (10)	9.98 ±0.40 (10)	10.89 ±0.31 (10)	11.67 ±0.36 (10)				

() : animal number

Table 8-1. Urinalysis of male rats

SUMMARY OF URINALYSIS									
STUDY ID : GT13-00174									
Group		Control		Low		Medium		High	
		5	%	5	%	5	%	5	%
No. of animals examined									
Glucose	negative	5	100	5	100	5	100	5	100
Bilirubin	negative	5	100	5	100	5	100	5	100
Ketone	negative	0	0	2	40	1	20	1	20
	trace	2	40	1	20	2	40	1	20
	1+	3	60	2	40	2	40	3	60
Specific Gravity	1.010	1	20	2	40	1	20	0	0
	1.015	2	40	1	20	2	40	2	40
	1.020	1	20	1	20	0	0	2	40
	1.025	0	0	1	20	1	20	0	0
	1.030	1	20	0	0	1	20	1	20
Occult Blood	negative	4	80	4	80	4	80	5	100
	trace	1	20	1	20	1	20	0	0
pH	5.5	0	0	0	0	1	20	0	0
	6.0	3	60	1	20	3	60	4	80
	6.5	1	20	1	20	0	0	1	20
	7.0	1	20	2	40	0	0	0	0
	7.5	0	0	1	20	1	20	0	0
Protein	1+	1	20	0	0	0	0	0	0
	2+	4	80	5	100	5	100	5	100
Urobilinogen	0.2 E.U./dl	3	60	2	40	1	20	0	0
	1.0 E.U./dl	2	40	3	60	4	80	5	100
Nitrate	negative	4	80	5	100	4	80	3	60
	positive	1	20	0	0	1	20	2	40
Leukocyte	negative	1	20	0	0	0	0	0	0
	trace	4	80	5	100	5	100	5	100

Table 8-2. Urinalysis of female rats

SUMMARY OF URINALYSIS									
STUDY ID : GT13-00174									
Group		Control		Low		Medium		High	
No. of animals examined		5	%	5	%	5	%	5	%
Glucose	negative	5	100	5	100	5	100	5	100
Bilirubin	negative	5	100	5	100	5	100	5	100
Ketone	negative	5	100	4	80	5	100	5	100
	trace	0	0	1	20	0	0	0	0
Specific Gravity	1.005	2	40	1	20	2	40	1	20
	1.010	2	40	3	60	2	40	3	60
	1.015	1	20	1	20	1	20	1	20
Occult Blood	negative	5	100	5	100	5	100	5	100
pH	7.0	1	20	1	20	0	0	1	20
	7.5	4	80	4	80	3	60	4	80
	8.0	0	0	0	0	2	40	0	0
Protein	negative	3	60	1	20	4	80	4	80
	trace	1	20	1	20	1	20	0	0
	1+	1	20	3	60	0	0	1	20
Urobilinogen	0.2 E.U./dl	5	100	3	60	5	100	5	100
	1.0 E.U./dl	0	0	2	40	0	0	0	0
Nitrate	negative	3	60	4	80	4	80	3	60
	positive	2	40	1	20	1	20	2	40
Leukocyte	negative	5	100	5	100	5	100	5	100

Table 9-1. Gross findings of male rats

SUMMARY OF GROSS FINDINGS						
STUDY : GT13-00174	ORGAN	OBSERVATION	GROUP			SEX : MALE
			Control	Low	Medium	
TESTIS (LEFT)		Normal	10/10	10/10	10/10	10/10
TESTIS (RIGHT)		Normal	10/10	10/10	10/10	10/10
KIDNEY (LEFT)		Normal	10/10	10/10	10/10	10/10
KIDNEY (RIGHT)		Normal	10/10	10/10	10/10	10/10
SPLEEN		Normal	10/10	10/10	10/10	10/10
LIVER		Normal	10/10	10/10	10/10	10/10
ADRENAL GLAND (LEFT)		Normal	10/10	10/10	10/10	10/10
ADRENAL GLAND (RIGHT)		Normal	10/10	10/10	10/10	10/10
HEART		Normal	10/10	10/10	10/10	10/10
THYMUS		Normal	10/10	10/10	10/10	10/10
LUNG (LEFT)		Normal	10/10	10/10	10/10	10/10
LUNG (RIGHT)		Normal	10/10	10/10	10/10	10/10
BRAIN		Normal	10/10	10/10	10/10	10/10
PITUITARY GLAND		Normal	10/10	10/10	10/10	10/10
OLFACTORY BULB		Normal	10/10	10/10	10/10	10/10
EYE (LEFT)		Normal	10/10	10/10	10/10	10/10
EYE (RIGHT)		Normal	10/10	10/10	10/10	10/10

Table 9-2. Gross findings of female rats

SUMMARY OF GROSS FINDINGS					
STUDY : GT13-00174		SEX : FEMALE			
ORGAN	OBSERVATION	Control	GROUP		
			Low	Medium	High
TESTIS (LEFT)	Normal	10/10	10/10	10/10	10/10
TESTIS (RIGHT)	Normal	10/10	10/10	10/10	10/10
KIDNEY (LEFT)	Normal	10/10	10/10	10/10	10/10
KIDNEY (RIGHT)	Normal	10/10	10/10	10/10	10/10
SPLEEN	Normal	10/10	10/10	10/10	10/10
LIVER	Normal	10/10	10/10	10/10	10/10
ADRENAL GLAND (LEFT)	Normal	10/10	10/10	10/10	10/10
ADRENAL GLAND (RIGHT)	Normal	10/10	10/10	10/10	10/10
HEART	Normal	10/10	10/10	10/10	10/10
THYMUS	Normal	10/10	10/10	10/10	10/10
LUNG (LEFT)	Normal	10/10	10/10	10/10	10/10
LUNG (RIGHT)	Normal	10/10	10/10	10/10	10/10
BRAIN	Normal	10/10	10/10	10/10	10/10
PITUITARY GLAND	Normal	10/10	10/10	10/10	10/10
OLFACCTORY BULB	Normal	10/10	10/10	10/10	10/10
EYE (LEFT)	Normal	10/10	10/10	10/10	10/10
EYE (RIGHT)	Normal Abnormal ^a	9/10 1/10	10/10 0/10	10/10 0/10	10/10 0/10

a : Opacity

Table 10-1. Absolute organ weights of male rats

SUMMARY OF ABSOLUTE ORGAN WEIGHTS								
STUDY : GT13-00174		UNIT : g				SEX : MALE		
ORGAN	Control	Low	Medium	High				
BODY WEIGHT	216.31 ±2.92 (10)	217.72 ±4.30 (10)	212.97 ±3.99 (10)	214.65 ±3.72 (10)				
TESTIS (LEFT)	1.38 ±0.01 (10)	1.38 ±0.02 (10)	1.35 ±0.02 (10)	1.36 ±0.01 (10)				
TESTIS (RIGHT)	1.36 ±0.02 (10)	1.37 ±0.03 (10)	1.33 ±0.02 (10)	1.33 ±0.02 (10)				
SPLEEN	0.54 ±0.02 (10)	0.53 ±0.02 (10)	0.53 ±0.02 (10)	0.53 ±0.01 (10)				
LIVER	6.49 ±0.11 (10)	6.52 ±0.12 (10)	6.38 ±0.17 (10)	6.44 ±0.13 (10)				
THYMUS	0.23 ±0.01 (10)	0.23 ±0.01 (10)	0.21 ±0.01 (10)	0.22 ±0.01 (10)				
ADRENAL GLAND (LEFT)	0.03 ±0.00 (10)	0.03 ±0.00 (10)	0.03 ±0.00 (10)	0.03 ±0.00 (10)				
ADRENAL GLAND (RIGHT)	0.02 ±0.00 (10)	0.02 ±0.00 (10)	0.02 ±0.00 (10)	0.02 ±0.00 (10)				
KIDNEY (LEFT)	0.74 ±0.01 (10)	0.74 ±0.02 (10)	0.73 ±0.02 (10)	0.73 ±0.01 (10)				
KIDNEY (RIGHT)	0.75 ±0.01 (10)	0.76 ±0.02 (10)	0.73 ±0.02 (10)	0.74 ±0.02 (10)				
HEART	0.73 ±0.02 (10)	0.72 ±0.02 (10)	0.70 ±0.02 (10)	0.72 ±0.02 (10)				
LUNG (LEFT)	0.31 ±0.01 (10)	0.31 ±0.01 (10)	0.31 ±0.01 (10)	0.30 ±0.01 (10)				
LUNG (RIGHT)	0.56 ±0.01 (10)	0.56 ±0.02 (10)	0.59 ±0.02 (10)	0.56 ±0.01 (10)				
BRAIN	1.81 ±0.02 (10)	1.83 ±0.01 (10)	1.78 ±0.02 (10)	1.80 ±0.01 ^a (10)				
PITUITARY GLAND	0.01 ±0.00 ^b (10)	0.01 ±0.00 (10)	0.01 ±0.00 (10)	0.01 ±0.00 ^b (10)				
OLFACCTORY	0.07 ±0.00 (10)	0.08 ±0.00 (10)	0.07 ±0.00 (10)	0.07 ±0.00 (10)				

() : number

a : p<0.05, high (↓) vs. low group

b : p<0.05, control and high (↓) vs. medium group

Table 10-2. Absolute organ weights of female rats

SUMMARY OF ABSOLUTE ORGAN WEIGHTS								
STUDY : GT13-00174		UNIT : g				SEX : FEMALE		
ORGAN	GROUP : (mean±S.E)	Control	Low	Medium	High			
BODY WEIGHT	135.03 ±1.57	(10)	131.66 ±1.94	(10)	135.78 ±2.58	(10)	134.12 ±2.17	(10)
TESTIS (LEFT)	0.02 ±0.00	(10)	0.02 ±0.00	(10)	0.02 ±0.00	(10)	0.02 ±0.00	(10)
TESTIS (RIGHT)	0.02 ±0.00	(10)	0.02 ±0.00	(10)	0.03 ±0.00	(10)	0.02 ±0.00	(10)
SPLEEN	0.34 ±0.01	(10)	0.33 ±0.01	(10)	0.34 ±0.01	(10)	0.34 ±0.01	(10)
LIVER	3.78 ±0.04	(10)	3.67 ±0.06	(10)	3.84 ±0.06	(10)	3.83 ±0.08	(10)
THYMUS	0.17 ±0.01	(10)	0.16 ±0.01	(10)	0.16 ±0.01	(10)	0.17 ±0.01	(10)
ADRENAL GLAND (LEFT)	0.03 ±0.00	(10)	0.03 ±0.00	(10)	0.03 ±0.00	(10)	0.03 ±0.00	(10)
ADRENAL GLAND (RIGHT)	0.02 ±0.00	(10)	0.02 ±0.00	(10)	0.03 ±0.00	(10)	0.03 ±0.00	(9)
KIDNEY (LEFT)	0.48 ±0.01	(10)	0.47 ±0.01	(10)	0.49 ±0.01	(10)	0.50 ±0.01	(10)
KIDNEY (RIGHT)	0.49 ±0.01	(10)	0.48 ±0.01	(10)	0.49 ±0.01	(10)	0.50 ±0.01	(10)
HEART	0.49 ±0.01	(10)	0.47 ±0.01	(10)	0.48 ±0.01	(10)	0.50 ±0.02	(10)
LUNG (LEFT)	0.22 ±0.00	(10)	0.22 ±0.01	(10)	0.23 ±0.00	(10)	0.23 ±0.01	(10)
LUNG (RIGHT)	0.41 ±0.01	(10)	0.41 ±0.01	(10)	0.42 ±0.01	(10)	0.42 ±0.01	(10)
BRAIN	1.67 ±0.01	(10)	1.68 ±0.01	(10)	1.67 ±0.01	(10)	1.68 ±0.01	(10)
PITUITARY GLAND	0.01 ±0.00	(10)	0.01 ±0.00	(10)	0.01 ±0.00	(10)	0.01 ±0.00	(10)
OLFACCTORY	0.07 ±0.00	(10)	0.07 ±0.00	(10)	0.07 ±0.00	(10)	0.07 ±0.00	(10)

() : number

Table 11-1. Relative organ weights of male rats

SUMMARY OF RELATIVE ORGAN WEIGHTS								
STUDY : GT13-00174		UNIT : % BODY WEIGHTS				SEX : MALE		
ORGAN	GROUP : (mean±S.E)	Control	Low	Medium	High			
BODY WEIGHT	216.31 ±2.92	(10)	217.72 ±4.30	(10)	212.97 ±3.99	(10)	214.65 ±3.72	(10)
TESTIS (LEFT)	0.64 ±0.01	(10)	0.64 ±0.01	(10)	0.63 ±0.01	(10)	0.63 ±0.01	(10)
TESTIS (RIGHT)	0.63 ±0.01	(10)	0.63 ±0.01	(10)	0.63 ±0.01	(10)	0.62 ±0.01	(10)
SPLEEN	0.25 ±0.01	(10)	0.24 ±0.00	(10)	0.25 ±0.01	(10)	0.25 ±0.00	(10)
LIVER	3.00 ±0.03	(10)	3.00 ±0.03	(10)	3.00 ±0.03	(10)	3.00 ±0.03	(10)
THYMUS	0.11 ±0.00	(10)	0.10 ±0.00	(10)	0.10 ±0.00	(10)	0.10 ±0.00	(10)
ADRENAL GLAND (LEFT)	0.01 ±0.00	(10)	0.01 ±0.00	(10)	0.01 ±0.00	(10)	0.01 ±0.00	(10)
ADRENAL GLAND (RIGHT)	0.01 ±0.00	(10)	0.01 ±0.00	(10)	0.01 ±0.00	(10)	0.01 ±0.00	(10)
KIDNEY (LEFT)	0.34 ±0.00	(10)	0.34 ±0.00	(10)	0.34 ±0.01	(10)	0.34 ±0.00	(10)
KIDNEY (RIGHT)	0.35 ±0.00	(10)	0.35 ±0.00	(10)	0.34 ±0.01	(10)	0.34 ±0.00	(10)
HEART	0.34 ±0.01	(10)	0.33 ±0.01	(10)	0.33 ±0.01	(10)	0.34 ±0.01	(10)
LUNG (LEFT)	0.15 ±0.00	(10)	0.14 ±0.00	(10)	0.14 ±0.00	(10)	0.14 ±0.00	(10)
LUNG (RIGHT)	0.26 ±0.00 ^a	(10)	0.26 ±0.01 ^a	(10)	0.28 ±0.01	(10)	0.26 ±0.00	(10)
BRAIN	0.84 ±0.01	(10)	0.84 ±0.02	(10)	0.84 ±0.01	(10)	0.84 ±0.01	(10)
PITUITARY GLAND	0.00 ±0.00	(10)	0.00 ±0.00	(10)	0.00 ±0.00 ^b	(10)	0.00 ±0.00	(10)
OLFACCTORY	0.03 ±0.00	(10)	0.03 ±0.00	(10)	0.04 ±0.00	(10)	0.03 ±0.00	(10)

() : number

a : p<0.05, control and low (↓) vs. medium group

b : p<0.01, medium (↑) vs. other groups

Table 11-2. Relative organ weights of female rats

SUMMARY OF RELATIVE ORGAN WEIGHTS								
STUDY : GT13-00174		UNIT : % BODY WEIGHTS				SEX : FEMALE		
ORGAN	GROUP : (mean±S.E)	Control	Low	Medium	High			
BODY WEIGHT	135.33 ±1.64	(10)	131.66 ±1.94	(10)	135.78 ±2.58	(10)	134.12 ±2.17	(10)
TESTIS (LEFT)	0.02 ±0.00	(10)	0.02 ±0.00	(10)	0.02 ±0.00	(10)	0.02 ±0.00	(10)
TESTIS (RIGHT)	0.02 ±0.00	(10)	0.02 ±0.00	(10)	0.02 ±0.00	(10)	0.02 ±0.00	(10)
SPLEEN	0.25 ±0.01	(10)	0.25 ±0.00	(10)	0.25 ±0.00	(10)	0.25 ±0.01	(10)
LIVER	2.80 ±0.03	(10)	2.79 ±0.04	(10)	2.83 ±0.03	(10)	2.86 ±0.04	(10)
THYMUS	0.12 ±0.00	(10)	0.12 ±0.00	(10)	0.12 ±0.00	(10)	0.13 ±0.00	(10)
ADRENAL GLAND (LEFT)	0.02 ±0.00	(10)	0.02 ±0.00	(10)	0.02 ±0.00	(10)	0.02 ±0.00	(10)
ADRENAL GLAND (RIGHT)	0.02 ±0.00	(10)	0.02 ±0.00	(10)	0.02 ±0.00	(10)	0.02 ±0.00	(9)
KIDNEY (LEFT)	0.36 ±0.01	(10)	0.36 ±0.01	(10)	0.36 ±0.01	(10)	0.37 ±0.00	(10)
KIDNEY (RIGHT)	0.36 ±0.01	(10)	0.36 ±0.01	(10)	0.36 ±0.00	(10)	0.37 ±0.01	(10)
HEART	0.36 ±0.01	(10)	0.36 ±0.00	(10)	0.35 ±0.00	(10)	0.37 ±0.01	(10)
LUNG (LEFT)	0.16 ±0.00	(10)	0.17 ±0.00	(10)	0.17 ±0.00	(10)	0.17 ±0.00	(10)
LUNG (RIGHT)	0.31 ±0.01	(10)	0.31 ±0.01	(10)	0.31 ±0.01	(10)	0.31 ±0.01	(10)
BRAIN	1.24 ±0.01	(10)	1.28 ±0.02	(10)	1.24 ±0.02	(10)	1.25 ±0.01	(10)
PITUITARY GLAND	0.00 ±0.00	(10)	0.00 ±0.00	(10)	0.01 ±0.00	(10)	0.01 ±0.00	(10)
OLFACCTORY	0.05 ±0.00	(10)	0.05 ±0.00	(10)	0.05 ±0.00	(10)	0.05 ±0.00	(10)

() : number

Table 12-1. Serum biochemical values of male rats

SUMMARY OF SERUM BIOCHEMICAL VALUES TESTS								
STUDY ID : GT13-00174 GROUP : (mean±S.E)	Control		Low	Medium	SEX : MALE			
						High		
ALB ¹ (g/dL)	2.75 ± 0.02	(10)	2.72 ± 0.02	(10)	2.74 ± 0.02	(10)	2.73 ± 0.02	(10)
ALP ² (IU/L)	738.90 ± 16.32	(10)	720.80 ± 17.49	(10)	744.00 ± 15.16	(10)	708.70 ± 17.29	(10)
CA ³ (mg/dL)	14.34 ± 0.08	(10)	14.44 ± 0.12	(10)	14.22 ± 0.22	(10)	14.62 ± 0.19	(10)
CHO ⁴ (mg/dL)	56.10 ± 1.47	(10)	59.30 ± 2.45	(10)	53.40 ± 1.51	(10)	0.58 ± 1.92	(10)
CRE ⁵ (mg/dL)	0.58 ± 0.03	(10)	0.54 ± 0.05	(10)	0.64 ± 0.08	(10)	0.67 ± 0.09	(10)
GGT ⁶ (IU/L)	0.00 ± 0.00	(10)	1.10 ± 0.50	(10)	0.90 ± 0.50	(10)	0.60 ± 0.50	(10)
GLU ⁷ (mg/dL)	163.00 ± 5.29	(10)	161.60 ± 6.86	(10)	145.40 ± 6.19	(10)	141.40 ± 6.05 ^a	(10)
GOT ⁸ (mg/dL)	105.60 ± 6.17	(10)	108.00 ± 7.67	(10)	122.50 ± 7.29	(10)	102.10 ± 10.65	(10)
GPT ⁹ (IU/L)	45.50 ± 2.42	(10)	45.80 ± 1.62	(10)	52.20 ± 3.80	(10)	46.40 ± 3.60	(10)
IP ¹⁰ (mg/dL)	7.27 ± 0.18	(10)	7.15 ± 0.22	(10)	7.86 ± 0.41	(10)	7.85 ± 0.41	(10)
LDH ¹¹ (IU/L)	726.60 ± 136.32	(10)	670.80 ± 160.89	(10)	954.60 ± 182.81	(10)	970.90 ± 145.22	(10)
MG ¹² (mg/dL)	2.12 ± 0.06	(10)	2.15 ± 0.02	(10)	2.29 ± 0.06	(10)	2.39 ± 0.06 ^b	(10)
TP ¹³ (g/dL)	5.95 ± 0.05	(10)	6.03 ± 0.07	(10)	5.95 ± 0.06	(10)	6.06 ± 0.03	(10)
UA ¹⁴ (mg/dL)	1.45 ± 0.10	(10)	1.30 ± 0.08	(10)	1.19 ± 0.17	(10)	1.63 ± 0.18	(10)
BUN ¹⁵ (mg/dL)	22.63 ± 0.33	(10)	21.84 ± 0.80	(10)	22.19 ± 0.51	(10)	23.89 ± 0.98	(10)
TBIL ¹⁶ (mg/dL)	0.03 ± 0.01	(10)	0.05 ± 0.01	(10)	0.17 ± 0.07	(10)	0.02 ± 0.01	(10)
TG ¹⁷ (mg/dL)	66.90 ± 5.38	(10)	61.00 ± 6.28	(10)	44.60 ± 6.46	(10)	56.40 ± 7.24	(10)
CK ¹⁸ (IU/L)	429.70 ± 63.89	(10)	421.60 ± 62.25	(10)	599.70 ± 132.80	(10)	676.50 ± 117.53	(10)
Na ¹⁹ (mmol/L)	147.50 ± 1.29	(10)	146.60 ± 0.27	(10)	146.70 ± 0.47	(10)	147.00 ± 0.30	(10)
K ²⁰ (mmol/L)	4.39 ± 0.06	(10)	4.26 ± 0.06	(10)	4.49 ± 0.06	(10)	4.69 ± 0.08 ^a	(10)
Cl ²¹ (mmol/L)	108.20 ± 0.93	(10)	108.00 ± 0.42	(10)	107.00 ± 0.75	(10)	107.40 ± 0.72	(10)
A/G ²²	0.86 ± 0.01 ^c	(10)	0.82 ± 0.01	(10)	0.86 ± 0.02	(10)	0.82 ± 0.01	(10)

() : number

1, Albumin; 2, Alkaline phosphatase; 3, Calcium; 4, Cholesterol; 5, Creatinine; 6, Gamma glutamyl transpeptidase; 7, Glucose;

8, Glutamic oxalacetic transaminase; 9, Glutamic pyruvic transaminase; 10, Inorganic phosphorus; 11, Lactate Dehydrogenase;

12, Magnesium; 13, Total protein; 14, Uric acid; 15, Blood urea nitrogen; 16, Total bilirubin; 17, Triglyceride; 18, Creatine

Kinase; 19, Sodium; 20, Potassium; 21, Chloride; 22, ratio of albumin and globulin

a : p<0.05, high (↓) vs. control and low groups

b : p<0.01, hihg (↑) vs. control and low groups

c : p<0.05, control (↑) vs. low and high groups

Table 12-2. Serum biochemical values of female rats

SUMMARY OF SERUM BIOCHEMICAL VALUES TESTS								
STUDY ID : GT13-00174 GROUP : (mean±S.E)	Control		Low	Medium	High	SEX : FEMALE		
ALB ¹ (g/dL)	2.71 ± 0.04	(10)	2.74 ± 0.03	(10)	2.73 ± 0.04	(10)	2.75 ± 0.03	(10)
ALP ² (IU/L)	534.40 ± 20.26	(10)	508.30 ± 15.48	(10)	517.60 ± 14.62	(10)	520.70 ± 18.03	(10)
CA ³ (mg/dL)	13.47 ± 0.15	(10)	13.52 ± 0.18	(10)	13.67 ± 0.19	(10)	13.43 ± 0.16	(10)
CHO ⁴ (mg/dL)	64.90 ± 2.70	(10)	66.50 ± 2.61	(10)	64.60 ± 3.15	(10)	69.40 ± 2.40	(10)
CRE ⁵ (mg/dL)	0.57 ± 0.07	(10)	0.63 ± 0.06	(10)	0.60 ± 0.05	(10)	0.57 ± 0.04	(10)
GGT ⁶ (IU/L)	2.90 ± 1.22	(10)	2.70 ± 1.41	(10)	3.60 ± 2.00	(10)	0.80 ± 0.80	(10)
GLU ⁷ (mg/dL)	135.80 ± 7.12	(10)	116.80 ± 5.10	(10)	129.60 ± 6.11	(10)	126.30 ± 6.49	(10)
GOT ⁸ (mg/dL)	115.50 ± 11.59	(10)	114.90 ± 6.40	(10)	118.40 ± 8.70	(10)	119.10 ± 7.59	(10)
GPT ⁹ (IU/L)	47.00 ± 4.62	(10)	46.10 ± 2.81	(10)	44.10 ± 2.19	(10)	45.20 ± 2.91	(10)
IP ¹⁰ (mg/dL)	6.73 ± 0.50	(10)	6.62 ± 0.53	(10)	6.59 ± 0.31	(10)	5.61 ± 0.24	(10)
LDH ¹¹ (IU/L)	757.60 ± 234.10	(10)	862.00 ± 143.94	(10)	997.60 ± 226.97	(10)	903.10 ± 172.95	(10)
MG ¹² (mg/dL)	2.20 ± 0.09	(10)	2.22 ± 0.06	(10)	2.20 ± 0.05	(10)	2.17 ± 0.03	(10)
TP ¹³ (g/dL)	5.82 ± 0.08	(10)	6.01 ± 0.06	(10)	5.89 ± 0.06	(10)	5.97 ± 0.05	(10)
UA ¹⁴ (mg/dL)	1.49 ± 0.10	(10)	1.81 ± 0.15	(10)	1.40 ± 0.10	(10)	1.44 ± 0.09	(10)
BUN ¹⁵ (mg/dL)	25.36 ± 0.72	(10)	24.59 ± 0.75	(10)	25.42 ± 0.73	(10)	24.00 ± 0.61	(10)
TBIL ¹⁶ (mg/dL)	0.08 ± 0.04	(10)	0.00 ± 0.00	(10)	0.03 ± 0.02	(10)	0.01 ± 0.01	(10)
TG ¹⁷ (mg/dL)	20.20 ± 3.10	(10)	19.20 ± 2.03	(10)	19.70 ± 2.03	(10)	22.10 ± 2.00	(10)
CK ¹⁸ (IU/L)	513.40 ± 145.88	(10)	554.50 ± 72.15	(10)	662.20 ± 138.39	(10)	517.80 ± 99.92	(10)
Na ¹⁹ (mmol/L)	147.00 ± 0.58	(10)	147.10 ± 0.43	(10)	146.00 ± 0.33	(10)	145.80 ± 0.25	(10)
K ²⁰ (mmol/L)	4.11 ± 0.05	(10)	4.15 ± 0.05	(10)	4.11 ± 0.05	(10)	4.15 ± 0.07	(10)
Cl ²¹ (mmol/L)	108.20 ± 0.49	(10)	108.30 ± 0.26	(10)	107.90 ± 0.64	(10)	108.50 ± 0.34	(10)
A/G ²²	0.87 ± 0.02	(10)	0.84 ± 0.01	(10)	0.86 ± 0.01	(10)	0.85 ± 0.01	(10)

() : number

1, Albumin; 2, Alkaline phosphatase; 3, Calcium; 4, Cholesterol; 5, Creatinine; 6, Gamma glutamyl transpeptidase; 7, Glucose; 8, Glutamic oxalacetic transaminase; 9, Glutamic pyruvic transaminase; 10, Inorganic phosphorus; 11, Lactate Dehydrogenase; 12, Magnesium; 13, Total protein; 14, Uric acid; 15, Blood urea nitrogen; 16, Total bilirubin; 17, Triglyceride; 18, Creatine Kinase; 19, Sodium; 20, Potassium; 21, Chloride; 22, ratio of albumin and globulin

Table 13-1. Hematological values of male rats

SUMMARY OF HEMATOLOGICAL TESTS					
STUDY ID : GT13-00174	Control		Low	Medium	SEX : MALE
GROUP : (mean±S.E)					High
WBC ¹ (K/µL)	3.29 ± 0.21 (10)	3.38 ± 0.29 (10)	2.97 ± 0.23 (10)	3.24 ± 0.29 (10)	
NE ² (K/µL)	0.95 ± 0.10 (10)	1.03 ± 0.08 (10)	0.74 ± 0.08 (10)	0.94 ± 0.08 (10)	
LY ³ (K/µL)	2.11 ± 0.22 (10)	2.16 ± 0.25 (10)	2.11 ± 0.25 (10)	2.05 ± 0.26 (10)	
MO ⁴ (K/µL)	0.12 ± 0.04 (10)	0.07 ± 0.01 (10)	0.05 ± 0.01 (10)	0.09 ± 0.01 (10)	
EO ⁵ (K/µL)	0.10 ± 0.04 (10)	0.10 ± 0.04 (10)	0.05 ± 0.01 (10)	0.11 ± 0.03 (10)	
LUC ⁶ (K/µL)	0.02 ± 0.00 (10)	0.03 ± 0.01 (10)	0.02 ± 0.00 (10)	0.04 ± 0.01 (10)	
BA ⁷ (K/µL)	0.00 ± 0.00 (10)	0.00 ± 0.00 (10)	0.00 ± 0.00 (10)	0.00 ± 0.00 (10)	
NEP ⁸ (%)	28.96 ± 2.57 (10)	31.05 ± 2.07 (10)	26.55 ± 3.56 (10)	30.00 ± 2.22 (10)	
LYP ⁹ (%)	63.20 ± 4.43 (10)	62.49 ± 3.70 (10)	69.03 ± 3.73 (10)	62.26 ± 3.37 (10)	
MOP ¹⁰ (%)	3.81 ± 1.31 (10)	2.05 ± 0.57 (10)	1.84 ± 0.42 (10)	2.83 ± 0.49 (10)	
EOP ¹¹ (%)	3.38 ± 1.40 (10)	3.34 ± 1.22 (10)	1.96 ± 0.63 (10)	3.67 ± 1.12 (10)	
LUP ¹² (%)	0.62 ± 0.13 (10)	1.01 ± 0.41 (10)	0.59 ± 0.10 (10)	1.20 ± 0.42 (10)	
BAP ¹³ (%)	0.04 ± 0.02 (10)	0.04 ± 0.02 (10)	0.06 ± 0.02 (10)	0.04 ± 0.02 (10)	
RBC ¹⁴ (M/µL)	9.23 ± 0.08 (10)	9.14 ± 0.06 (10)	9.29 ± 0.05 (10)	9.30 ± 0.08 (10)	
Hb ¹⁵ (g/dL)	15.39 ± 0.34 (10)	15.58 ± 0.09 (10)	15.73 ± 0.12 (10)	15.79 ± 0.10 (10)	
HCT ¹⁶ (%)	47.16 ± 0.45 (10)	46.74 ± 0.29 (10)	47.72 ± 0.22 (10)	47.75 ± 0.54 (10)	
MCV ¹⁷ (fL)	51.06 ± 0.26 (10)	51.11 ± 0.13 (10)	51.37 ± 0.27 (10)	51.32 ± 0.35 (10)	
MCH ¹⁸ (pg)	16.68 ± 0.35 (10)	17.04 ± 0.08 (10)	16.95 ± 0.07 (10)	16.97 ± 0.07 (10)	
MCHC ¹⁹ (g/dL)	32.65 ± 0.67 (10)	33.32 ± 0.16 (10)	32.97 ± 0.21 (10)	33.09 ± 0.22 (10)	
RDW ²⁰ (%))	11.97 ± 0.12 (10)	11.79 ± 0.06 (10)	12.05 ± 0.12 (10)	11.80 ± 0.06 (10)	
PLT ²¹ (K/µL)	862.00 ± 23.97 (10)	834.50 ± 25.63 (10)	841.50 ± 18.00 (10)	776.60 ± 53.55 (10)	
MPV ²² (fL)	10.15 ± 0.33 (10)	9.85 ± 0.46 (10)	10.80 ± 0.40 (10)	10.49 ± 0.37 (10)	
Reti ²³	2.85 ± 0.12 (10)	2.69 ± 0.07 (10)	2.94 ± 0.15 (10)	2.74 ± 0.09 (10)	

() : number

1, White blood cell; 2, Neutrophils; 3, Lymphocyte; 4, Monocyte; 5, Eosinophil; 6, Large unstain cells; 7, Basophil; 8, Percent of neutrophils; 9, Percent of lymphocyte; 10, Percent of monocyte; 11, Percent of eosinophil; 12, Large unstain cells percent; 13, Percent of basophil; 14, Red blood cell; 15, Hemoglobin; 16, Hematocrit; 17, Mean corpuscular volume; 18, Mean corpuscular hemoglobin; 19, Mean corpuscular hemoglobin concentration; 20, Red cell distribution width; 21, Platelet; 22, Mean platelet volume; 23, Reticulocyte

Table 13-2. Hematological values of female rats

SUMMARY OF HEMATOLOGICAL TESTS					
STUDY ID : GT13-00174	Control		Medium		SEX : FEMALE
GROUP : (mean±S.E)		Low		High	
WBC ¹ (K/µL)	2.85 ± 0.21 (10)	2.74 ± 0.16 (10)	2.71 ± 0.26 (10)	2.87 ± 0.19 (10)	
NE ² (K/µL)	0.81 ± 0.07 (10)	0.77 ± 0.07 (10)	0.72 ± 0.09 (10)	0.88 ± 0.05 (10)	
LY ³ (K/µL)	1.93 ± 0.14 (10)	1.86 ± 0.14 (10)	1.86 ± 0.19 (10)	1.87 ± 0.15 (10)	
MO ⁴ (K/µL)	0.05 ± 0.01 (10)	0.04 ± 0.01 (10)	0.05 ± 0.01 (10)	0.05 ± 0.00 (10)	
EO ⁵ (K/µL)	0.05 ± 0.01 (10)	0.05 ± 0.01 (10)	0.07 ± 0.01 (10)	0.07 ± 0.01 (10)	
LUC ⁶ (K/µL)	0.01 ± 0.01 (10)	0.01 ± 0.00 (10)	0.02 ± 0.00 (10)	0.01 ± 0.00 (10)	
BA ⁷ (K/µL)	0.00 ± 0.00 (10)	0.00 ± 0.00 (10)	0.00 ± 0.00 (10)	0.00 ± 0.00 (10)	
NEP ⁸ (%)	28.36 ± 1.50 (10)	28.38 ± 2.22 (10)	26.40 ± 2.77 (10)	31.01 ± 1.45 (10)	
LYP ⁹ (%)	67.69 ± 1.59 (10)	67.56 ± 2.31 (10)	68.33 ± 2.45 (10)	64.66 ± 1.42 (10)	
MOP ¹⁰ (%)	1.65 ± 0.14 (10)	1.53 ± 0.19 (10)	1.96 ± 0.27 (10)	1.68 ± 0.10 (10)	
EOP ¹¹ (%)	1.83 ± 0.16 (10)	2.16 ± 0.45 (10)	2.70 ± 0.69 (10)	2.34 ± 0.33 (10)	
LUP ¹² (%)	0.42 ± 0.14 (10)	0.33 ± 0.05 (10)	0.57 ± 0.18 (10)	0.27 ± 0.05 (10)	
BAP ¹³ (%)	0.04 ± 0.02 (10)	0.07 ± 0.02 (10)	0.04 ± 0.02 (10)	0.05 ± 0.02 (10)	
RBC ¹⁴ (M/µL)	9.13 ± 0.07 (10)	9.14 ± 0.06 (10)	9.15 ± 0.08 (10)	9.05 ± 0.06 (10)	
Hb ¹⁵ (g/dL)	16.10 ± 0.15 (10)	16.21 ± 0.10 (10)	16.23 ± 0.16 (10)	16.08 ± 0.12 (10)	
HCT ¹⁶ (%)	48.37 ± 0.62 (10)	48.74 ± 0.53 (10)	48.31 ± 0.51 (10)	48.17 ± 0.36 (10)	
MCV ¹⁷ (fL)	52.99 ± 0.44 (10)	53.32 ± 0.52 (10)	52.79 ± 0.28 (10)	53.25 ± 0.49 (10)	
MCH ¹⁸ (pg)	17.65 ± 0.07 (10)	17.73 ± 0.04 (10)	17.71 ± 0.07 (10)	17.76 ± 0.04 (10)	
MCHC ¹⁹ (g/dL)	33.35 ± 0.31 (10)	33.27 ± 0.28 (10)	33.56 ± 0.16 (10)	33.38 ± 0.32 (10)	
RDW ²⁰ (%))	11.71 ± 0.11 (10)	11.66 ± 0.12 (10)	11.67 ± 0.10 (10)	11.64 ± 0.09 (10)	
PLT ²¹ (K/µL)	777.80 ± 32.55 (10)	817.20 ± 26.95 (10)	785.40 ± 19.37 (10)	794.40 ± 42.45 (10)	
MPV ²² (fL)	10.57 ± 0.18 (10)	10.44 ± 0.36 (10)	10.49 ± 0.28 (10)	10.09 ± 0.51 (10)	
Reti ²³	2.50 ± 0.13 (10)	2.28 ± 0.07 (10)	2.28 ± 0.10 (10)	2.28 ± 0.07 (10)	

() : number

1, White blood cell; 2, Neutrophils; 3, Lymphocyte; 4, Monocyte; 5, Eosinophil; 6, Large unstain cells; 7, Basophil; 8, Percent of neutrophils; 9, Percent of lymphocyte; 10, Percent of monocyte; 11, Percent of eosinophil; 12, Large unstain cells percent; 13, Percent of basophil; 14, Red blood cell; 15, Hemoglobin; 16, Hematocrit; 17, Mean corpuscular volume; 18, Mean corpuscular hemoglobin; 19, Mean corpuscular hemoglobin concentration; 20, Red cell distribution width; 21, Platelet; 22, Mean platelet volume; 23, Reticulocyte

Table 14-1. Blood coagulation test in male rats

SUMMARY OF BLOOD COAGULATION					
STUDY : GT13-00174			SEX : MALE		
GROUP: (mean±S.E)	Control	Low	Medium	High	
APTT†	20.47 ± 0.48 (10)	20.43 ± 0.15 (10)	20.64 ± 0.25 (10)	20.74 ± 0.58 (10)	
PT‡	8.60 ± 0.10 (10)	8.57 ± 0.10 (10)	8.58 ± 0.11 (10)	8.54 ± 0.11 (10)	

() : number

† : activated partial thromboplastin time (sec)

‡ : prothrombin time (sec)

Table 14-2. Blood coagulation test in female rats

SUMMARY OF BLOOD COAGULATION					
STUDY : GT13-00174			SEX : FEMALE		
GROUP: (mean±S.E)	Control	Low	Medium	High	
APTT†	23.83 ± 1.04 (10)	23.30 ± 0.73 (10)	26.33 ± 0.70 (10)	23.84 ± 0.71 (10)	
PT‡	9.63 ± 0.56 (10)	9.21 ± 0.22 (10)	9.79 ± 0.20 (10)	9.23 ± 0.14 (10)	

() : number

† : activated partial thromboplastin time (sec)

‡ : prothrombin time (sec)

Table 15-1. Histopathological findings of male rats

SUMMARY OF HISTOPATHOLOGICAL FINDINGS			
STUDY : GT13-00174		SEX : MALE	
ORANS	SINGS	GROUP(mg/kg/day)	
		C(0)	H(1.0)
		N (%)	N (%)
Liver	No remarkable lesions	10/10 (100)	10/10 (100)
	No remarkable lesions	8/10 (80)	9/10 (90)
Kidney	Remarkable lesions	2/10 (20)	1/10 (10)
	-Basophilic tubule, focal, cortex	± 2/10 (20)	1/10 (10)
Adrenal gl.	No remarkable lesions	10/10 (100)	10/10 (100)
Urinary bladder	No remarkable lesions	10/10 (100)	10/10 (100)
Spleen	No remarkable lesions	10/10 (100)	10/10 (100)
Pancreas	No remarkable lesions	10/10 (100)	10/10 (100)
Thymus	No remarkable lesions	10/10 (100)	10/10 (100)
	No remarkable lesions	10/10 (100)	8/10 (80)
Thyroid	Remarkable lesions	0/10 (0)	2/10 (20)
	-Ectopic thymus	± 0/10 (0)	2/10 (20)
Parathyroid	No remarkable lesions	10/10 (100)	9/9 (100)
Trachea	No remarkable lesions	10/10 (100)	10/10 (100)
Esophagus	No remarkable lesions	10/10 (100)	10/10 (100)
Tongue	No remarkable lesions	10/10 (100)	10/10 (100)
	No remarkable lesions	9/10 (90)	10/10 (100)
Lung	Remarkable lesions	1/10 (10)	0/10 (0)
	-Accumulation, alveolar macrophage, focal	± 1/10 (10)	0/10 (0)
Heart	No remarkable lesions	10/10 (100)	10/10 (100)
Submandibular LN	No remarkable lesions	10/10 (100)	10/10 (100)
Mesenteric LN	No remarkable lesions	10/10 (100)	10/10 (100)
Salivary gl. submandibular	No remarkable lesions	10/10 (100)	10/10 (100)
Salivary gl. sublingual	No remarkable lesions	10/10 (100)	10/10 (100)
Salivary gl. parotid	No remarkable lesions	10/10 (100)	10/10 (100)
Stomach	No remarkable lesions	10/10 (100)	10/10 (100)
Duodenum	No remarkable lesions	10/10 (100)	10/10 (100)
Ileum	No remarkable lesions	10/10 (100)	10/10 (100)
Jejunum	No remarkable lesions	10/10 (100)	10/10 (100)
Cecum	No remarkable lesions	10/10 (100)	10/10 (100)
Colon	No remarkable lesions	10/10 (100)	10/10 (100)
Rectum	No remarkable lesions	10/10 (100)	10/10 (100)

N: Number of animals with the signs / Number of examined animals

±: minimal, gl.=gland, LN=lymph node

Table 15-1. Histopathological findings of male rats(continued)

		SUMMARY OF HISTOPATHOLOGICAL FINDINGS			
STUDY : GT13-00174		SEX : MALE			
ORANS	SINGs	GROUP(mg/kg/day)		C(0) H(1.0)	
		N	(%)	N	(%)
Skin	No remarkable lesions	10/10	(100)	10/10	(100)
Mammary gl.	No remarkable lesions	10/10	(100)	10/10	(100)
Eye	No remarkable lesions	10/10	(100)	10/10	(100)
Optic nerve	No remarkable lesions	10/10	(100)	10/10	(100)
Harderian gl.	No remarkable lesions	10/10	(100)	10/10	(100)
Brain	No remarkable lesions	10/10	(100)	10/10	(100)
Pituitary	No remarkable lesions	9/9	(100)	10/10	(100)
Femur	No remarkable lesions	10/10	(100)	10/10	(100)
Spinal cord	No remarkable lesions	10/10	(100)	10/10	(100)
Skeletal muscle	No remarkable lesions	10/10	(100)	10/10	(100)
Sciatic nerve	No remarkable lesions	10/10	(100)	10/10	(100)
Testis	No remarkable lesions	10/10	(100)	10/10	(100)
Epididymis	No remarkable lesions	10/10	(100)	10/10	(100)
Prostate	No remarkable lesions	10/10	(100)	10/10	(100)
Seminal vesicle	No remarkable lesions	10/10	(100)	10/10	(100)
Coagulating gl.	No remarkable lesions	10/10	(100)	10/10	(100)
Sternum	No remarkable lesions	10/10	(100)	10/10	(100)
Nasal cavity	No remarkable lesions	10/10	(100)	10/10	(100)

N: Number of animals with the signs / Number of examined animals
gl.=gland

Table 15-2. Histopathological finding of female rats

SUMMARY OF HISTOPATHOLOGICAL FINDINGS			
STUDY : GT13-00174	ORANS	SEX : FEMALE	
		GROUP(mg/kg/day)	
	SINGs	C(0)	H(1.0)
		N (%)	N (%)
Liver	No remarkable lesions	10/10 (100)	10/10 (100)
	No remarkable lesions	2/10 (20)	1/10 (10)
Kidney	Remarkable lesions	8/10 (80)	9/10 (90)
	-Mineralization, focal, outer stripe	± 8/10 (80)	9/10 (90)
	No remarkable lesions	9/10 (90)	10/10 (100)
Adrenal gl.	Remarkable lesions	1/10 (10)	0/10 (0)
	-Hemorrhage, focal, cortex	± 1/10 (10)	0/10 (0)
Urinary bladder	No remarkable lesions	10/10 (100)	10/10 (100)
Spleen	No remarkable lesions	10/10 (100)	10/10 (100)
Pancreas	No remarkable lesions	8/8 (100)	10/10 (100)
Thymus	No remarkable lesions	10/10 (100)	10/10 (100)
	No remarkable lesions	8/10 (80)	10/10 (100)
Thyroid	Remarkable lesions	2/10 (20)	0/10 (0)
	-Ultimobranchial cyst	± 2/10 (20)	0/10 (0)
Parathyroid	No remarkable lesions	9/9 (100)	10/10 (100)
Trachea	No remarkable lesions	10/10 (100)	10/10 (100)
Esophagus	No remarkable lesions	10/10 (100)	10/10 (100)
Tongue	No remarkable lesions	10/10 (100)	10/10 (100)
	No remarkable lesions	7/10 (70)	6/10 (60)
Lung	Remarkable lesions	3/10 (30)	4/10 (40)
	-Accumulation, alveolar macrophage, focal	± 3/10 (30)	4/10 (40)
	-Bronchiolization, focal	± 1/10 (10)	0/10 (0)
Heart	No remarkable lesions	10/10 (100)	10/10 (100)
Submandibular LN	No remarkable lesions	10/10 (100)	10/10 (100)
Mesenteric LN	No remarkable lesions	10/10 (100)	10/10 (100)
Salivary gl. submandibular	No remarkable lesions	10/10 (100)	10/10 (100)
Salivary gl. sublingual	No remarkable lesions	10/10 (100)	10/10 (100)
Salivary gl. parotid	No remarkable lesions	10/10 (100)	10/10 (100)
Stomach	No remarkable lesions	10/10 (100)	10/10 (100)
Duodenum	No remarkable lesions	8/8 (100)	10/10 (100)
Ileum	No remarkable lesions	10/10 (100)	10/10 (100)
Jejunum	No remarkable lesions	10/10 (100)	10/10 (100)
Cecum	No remarkable lesions	10/10 (100)	10/10 (100)
Colon	No remarkable lesions	10/10 (100)	10/10 (100)

N: Number of animals with the signs / Number of examined animals

±: minimal, gl.=gland, LN=lymph node

Table 29. Histopathological finding of female rats(continued)

SUMMARY OF HISTOPATHOLOGICAL FINDINGS			
STUDY : GT13-00174		SEX : FEMALE	
ORANS	SINGs	GROUP(mg/kg/day)	
		C(0)	H(1.0)
		N (%)	N (%)
Rectum	No remarkable lesions	10/10 (100)	10/10 (100)
Skin	No remarkable lesions	10/10 (100)	10/10 (100)
Mammary gl.	No remarkable lesions	10/10 (100)	10/10 (100)
	No remarkable lesions	9/10 (90)	10/10 (100)
	Remarkable lesions	1/10 (10)	0/10 (0)
Eye	-Lenticular degeneration, unilateral	++ 1/10 (10)	0/10 (0)
	-Hyperplasia, lens epithelial, unilateral	± 1/10 (10)	0/10 (0)
	-Complete loss, retinal layers, unilateral	++ 1/10 (10)	0/10 (0)
Optic nerve	No remarkable lesions	9/9 (100)	10/10 (100)
Harderian gl.	No remarkable lesions	10/10 (100)	10/10 (100)
Brain	No remarkable lesions	10/10 (100)	10/10 (100)
Pituitary	No remarkable lesions	10/10 (100)	10/10 (100)
Femur	No remarkable lesions	10/10 (100)	10/10 (100)
Spinal cord	No remarkable lesions	10/10 (100)	9/9 (100)
Skeletal muscle	No remarkable lesions	10/10 (100)	10/10 (100)
Sciatic nerve	No remarkable lesions	10/10 (100)	10/10 (100)
Ovary	No remarkable lesions	10/10 (100)	10/10 (100)
Uterus	No remarkable lesions	10/10 (100)	10/10 (100)
Vagina	No remarkable lesions	10/10 (100)	10/10 (100)
Sternum	No remarkable lesions	10/10 (100)	10/10 (100)
Nasal cavity	No remarkable lesions	10/10 (100)	10/10 (100)

N: Number of animals with the signs / Number of examined animals

±: minimal, +: mild, ++: moderate, gl.=gland

8. FIGURE

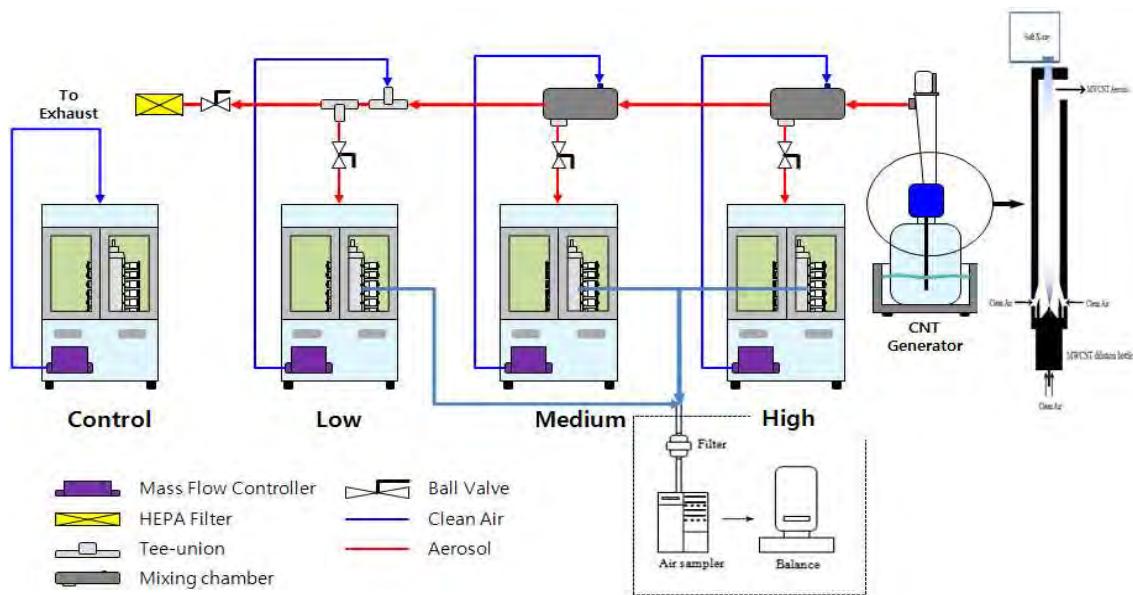


Figure 1. Schematic diagram of inhalation toxicity study

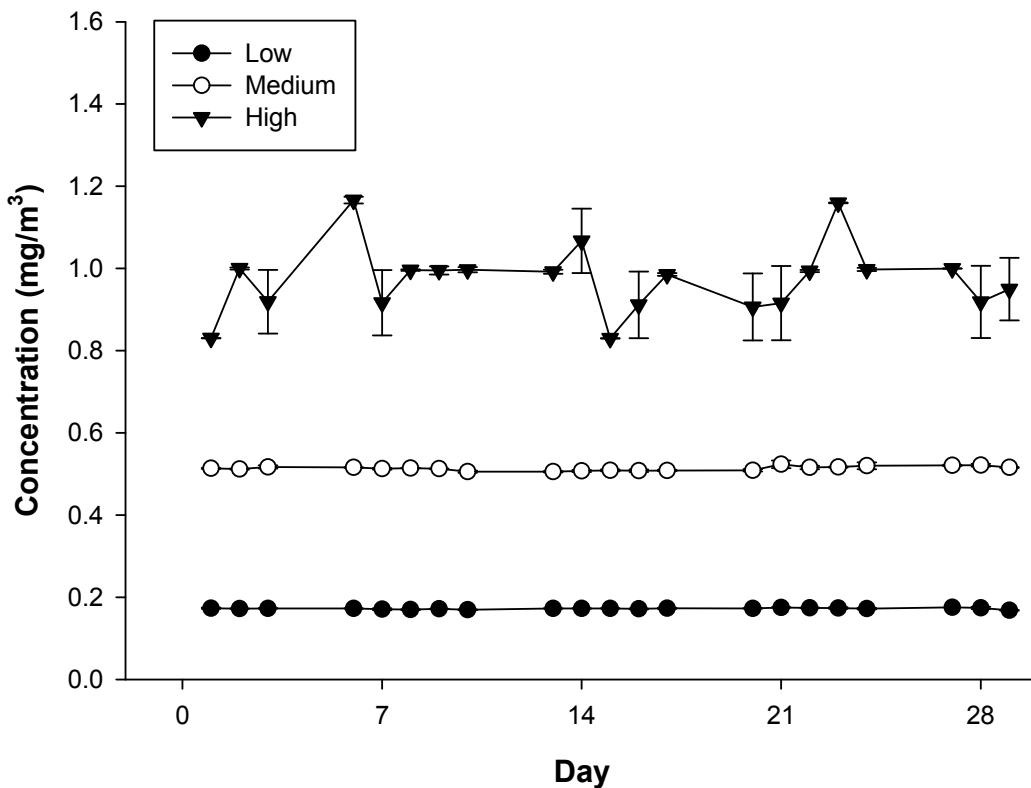


Figure 2. Daily chamber concentration of test substance

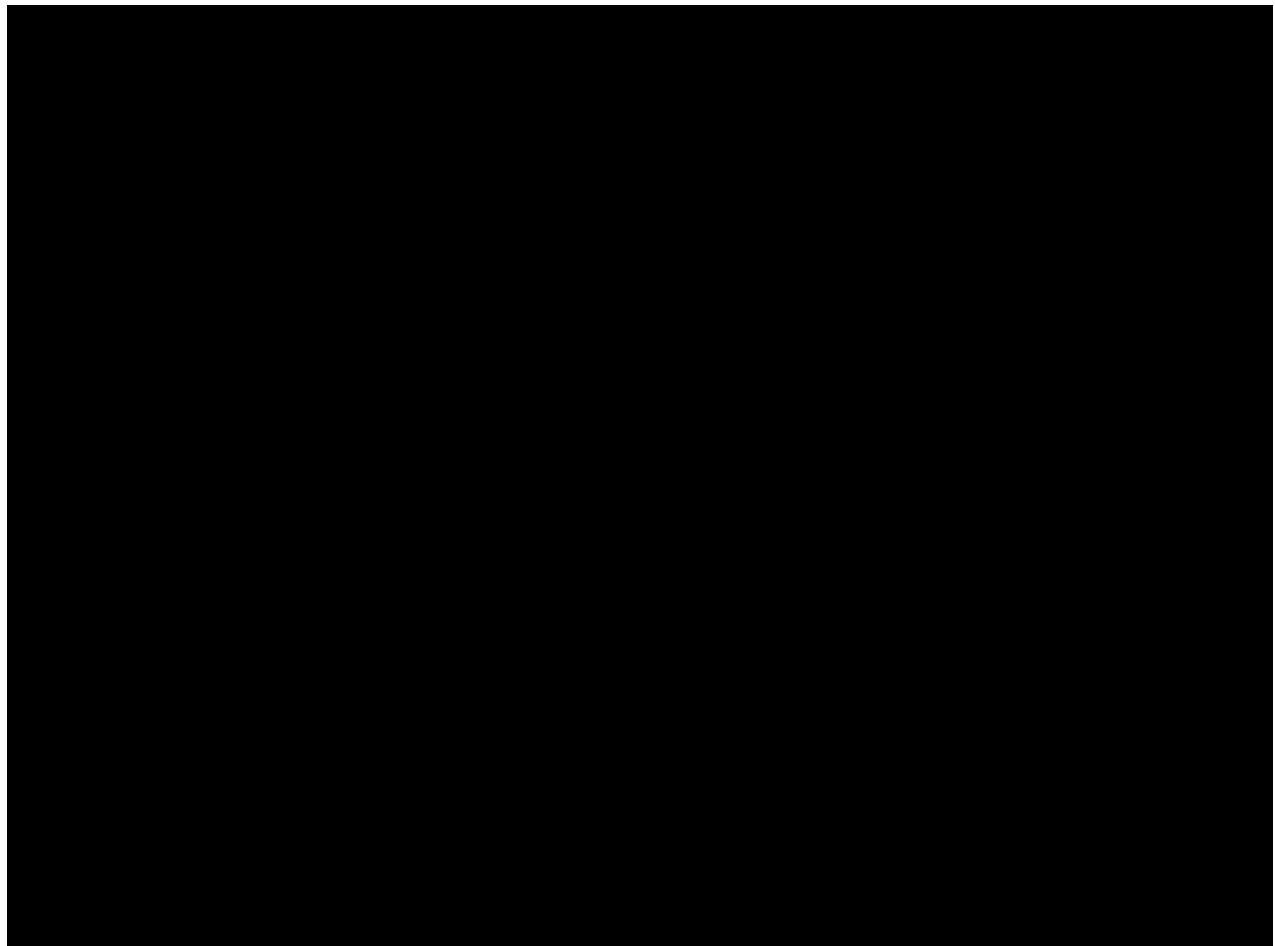


Figure 3. MWCNT by TEM

A~C : Scanning Transmission Electron Microscope ($\times 100,000$)

D : EDX spectometer

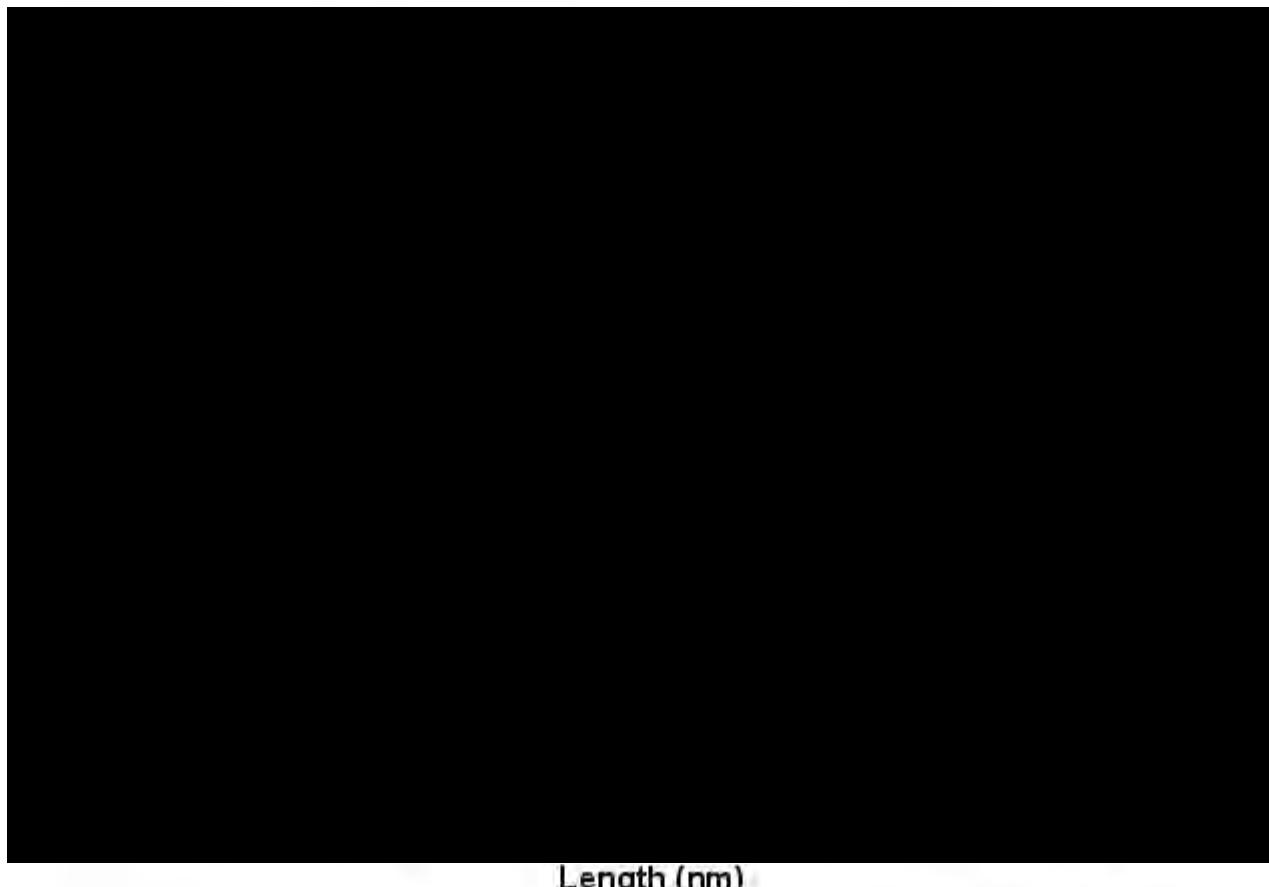


Figure 4. Cumulative mean length of MWCNT

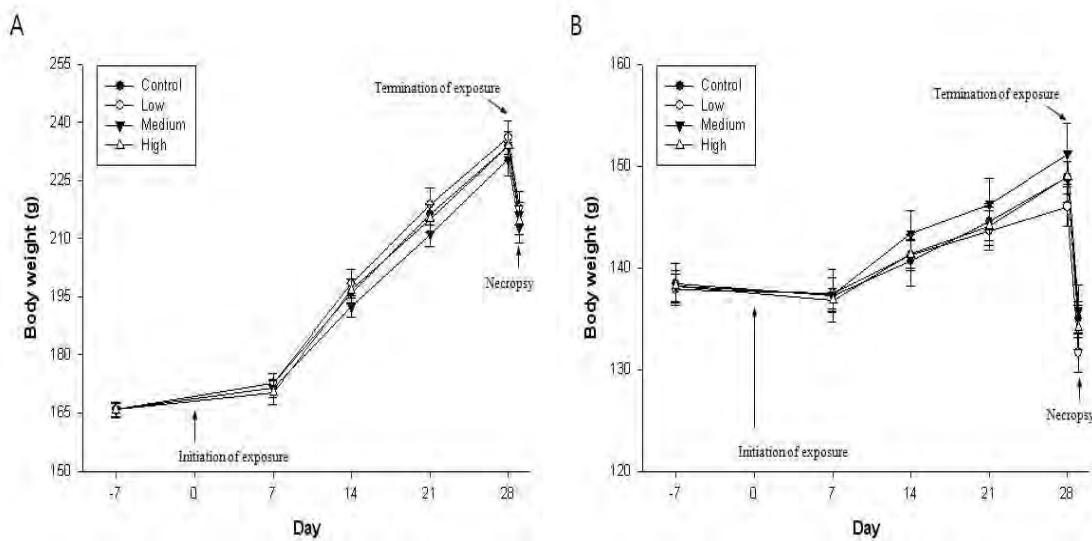


Figure 5. Body weight changes, A : male, B : female

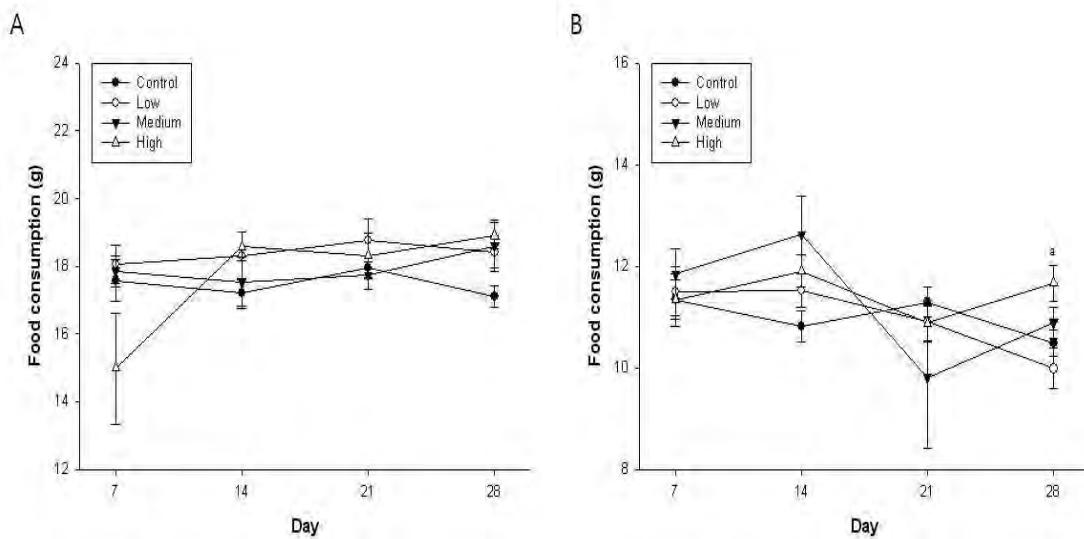


Figure 6. Food consumption, A : male, B : female

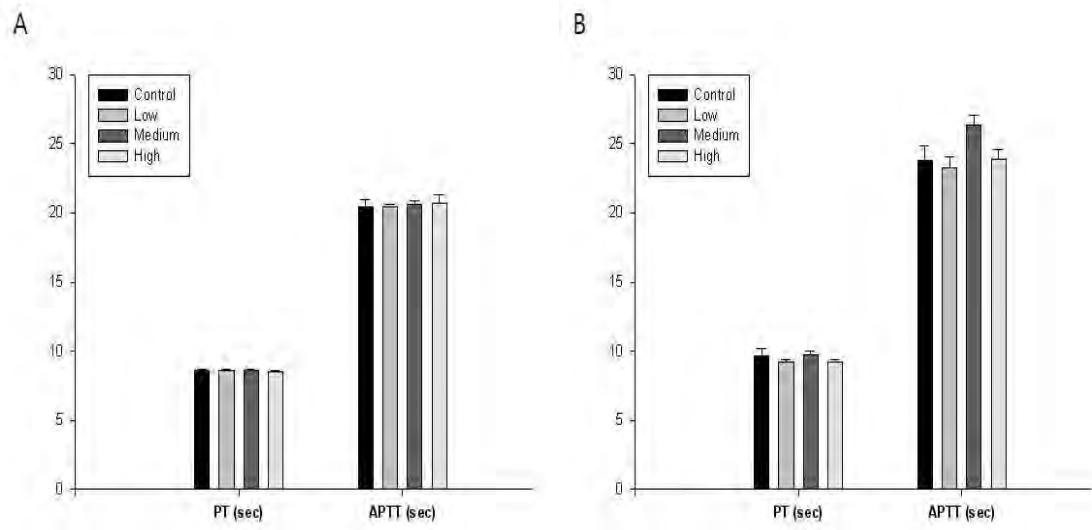


Figure 7. Blood clotting time, A : male, B : female

9. APPENDICES

Appendix 1. Daily condition of exposure chamber

DAILY CONDITION OF EXPOSURE CHAMBER															
No	DAY	Control							Low						
		Temp	Humi	O ₂	CO ₂	△.P.ch	flow	Temp	Humi	O ₂	CO ₂	△.P.ch	flow		
1	06/05	23.38	45.07	20.06	375.08	-283.18	22.16	22.52	55.30	20.50	367.74	-282.25	25.40		
2	06/06	21.54	46.31	20.05	348.59	-294.14	22.14	21.80	52.17	20.50	340.43	-292.84	25.53		
3	06/07	23.55	44.18	20.07	340.90	-271.79	21.94	23.46	42.71	20.50	356.94	-298.44	26.71		
4	06/10	23.47	40.82	20.07	325.19	-291.35	22.31	23.64	43.19	20.50	339.92	-281.92	25.26		
5	06/11	23.86	42.80	20.07	354.98	-280.69	22.02	23.15	43.92	20.50	369.33	-286.56	25.61		
6	06/12	23.76	43.04	20.06	321.77	-270.28	18.18	22.69	47.73	20.50	347.22	-286.60	25.73		
7	06/13	23.43	42.45	20.08	363.11	-275.88	21.87	22.41	47.50	20.50	375.75	-296.58	26.26		
8	06/14	23.21	42.59	20.08	336.41	-271.43	21.62	22.40	47.30	20.50	370.31	-276.24	24.93		
9	06/17	22.87	41.16	20.04	358.11	-277.16	22.04	22.31	47.76	20.50	370.11	-292.75	26.05		
10	06/18	23.10	41.59	20.06	331.48	-282.76	22.22	22.30	48.84	20.50	365.51	-299.02	26.27		
11	06/19	23.49	40.36	20.06	357.54	-293.75	22.61	22.84	49.22	20.50	380.32	-299.35	25.94		
12	06/20	24.03	42.57	20.08	334.54	-275.04	21.80	23.72	46.62	20.50	349.07	-279.71	25.41		
13	06/21	23.91	44.51	20.07	359.93	-270.62	21.37	23.45	47.93	20.50	366.97	-285.63	25.82		
14	06/24	23.59	44.51	20.07	328.77	-276.92	21.50	23.67	46.74	20.50	351.09	-304.45	26.84		
15	06/25	23.54	42.99	20.05	359.93	-281.36	22.30	23.83	47.19	20.50	370.84	-290.43	26.14		
No	DAY	Medium							High						
		Temp	Humi	O ₂	CO ₂	△.P.ch	flow	Temp	Humi	O ₂	CO ₂	△.P.ch	flow		
1	06/05	22.51	53.73	20.19	373.32	-272.45	24.08	20.68	59.22	20.19	369.82	-293.61	24.99		
2	06/06	22.20	55.24	20.20	365.92	-278.07	23.89	21.31	57.33	20.24	373.30	-287.95	24.03		
3	06/07	23.04	52.51	20.21	364.65	-282.37	25.02	22.82	56.65	20.27	371.65	-302.84	25.80		
4	06/10	23.23	53.13	20.21	351.23	-277.62	24.31	22.54	58.34	20.26	368.75	-291.70	25.07		
5	06/11	22.76	56.08	20.18	367.75	-293.03	24.84	22.22	58.34	20.25	371.63	-286.02	24.51		
6	06/12	22.50	51.52	20.21	349.06	-284.75	24.84	21.93	54.65	20.30	353.64	-283.66	24.35		
7	06/13	22.59	53.40	20.18	360.10	-302.52	25.55	22.39	57.07	20.28	294.58	-289.26	24.74		
8	06/14	22.62	53.90	20.21	350.00	-274.99	24.31	22.48	57.78	20.26	304.42	-277.02	24.25		
9	06/17	22.41	55.12	20.15	370.78	-294.16	25.11	22.27	59.24	20.30	366.90	-299.42	24.53		
10	06/18	22.73	54.53	20.16	350.33	-292.69	25.15	22.28	58.32	20.25	369.52	-281.00	24.16		
11	06/19	22.90	52.47	20.16	372.32	-301.22	25.32	22.75	58.05	20.25	368.16	-299.72	25.17		
12	06/20	23.56	51.92	20.22	346.50	-296.67	25.31	22.82	57.30	20.27	362.68	-282.37	24.53		
13	06/21	23.55	53.75	20.18	363.89	-281.30	24.81	22.70	57.59	20.26	368.12	-281.80	24.81		
14	06/24	23.06	54.38	20.18	343.31	-271.17	24.34	22.38	58.10	20.27	347.05	-284.85	24.94		
15	06/25	23.35	52.73	20.16	370.55	-292.51	25.31	22.88	57.00	20.27	362.97	-287.84	25.05		

Appendix 1. Daily condition of exposure chamber (continued)

DAILY CONDITION OF EXPOSURE CHAMBER

GT13-00174

No	DAY	Control						Low					
		Temp	Humi	O ₂	CO ₂	△P.ch	flow	Temp	Humi	O ₂	CO ₂	△P.ch	flow
16	06/26	23.59	43.76	20.07	323.90	-280.72	22.10	23.00	48.54	20.50	349.17	-281.22	25.57
17	06/27	23.89	43.46	20.07	358.92	-273.25	21.96	23.49	48.53	20.50	373.47	-287.71	25.98
18	06/28	24.04	42.44	20.08	328.22	-280.09	22.08	23.42	46.95	20.50	346.91	-277.50	25.31
19	07/01	24.20	41.57	20.08	364.60	-270.28	22.17	23.50	46.91	20.50	382.16	-278.01	25.44
20	07/02	23.14	45.35	20.03	339.92	-292.44	21.68	22.32	48.60	20.50	345.85	-281.72	25.64
21	07/03	23.14	45.35	20.03	339.92	-292.44	22.55	22.32	48.60	20.50	345.85	-281.72	25.55
No	DAY	Medium						High					
		Temp	Humi	O ₂	CO ₂	△P.ch	flow	Temp	Humi	O ₂	CO ₂	△P.ch	flow
16	06/26	23.28	52.92	20.19	341.26	-283.19	24.74	22.82	56.47	20.30	346.38	-276.46	24.19
17	06/27	23.59	55.57	20.16	363.64	-278.91	24.71	23.02	57.22	20.29	364.64	-292.70	25.19
18	06/28	23.24	55.53	20.18	340.40	-272.68	24.00	22.08	58.35	20.25	369.30	-273.49	23.57
19	07/01	23.32	53.73	20.16	374.77	-273.57	24.42	22.37	58.73	20.27	375.09	-287.15	24.99
20	07/02	21.95	55.08	20.11	341.23	-273.83	24.84	21.78	59.35	20.23	345.19	-273.46	25.29
21	07/03	21.95	55.08	20.11	341.23	-273.83	24.33	21.78	59.35	20.23	345.19	-275.00	24.04

Appendix 2. Daily concentration of MWCNT

DAILY CONCENTRATION OF MWCNT				
		Group		
DAY	TIMES	Control	Low	Medium
06/05	1	0.00	0.172	0.515
	2	0.00	0.175	0.513
06/06	1	0.00	0.175	0.513
	2	0.00	0.173	0.513
06/07	1	0.00	0.172	0.521
	2	0.00	0.174	0.513
06/10	1	0.00	0.173	0.517
	2	0.00	0.173	0.515
06/11	1	0.00	0.169	0.515
	2	0.00	0.173	0.510
06/12	1	0.00	0.171	0.515
	2	0.00	0.169	0.514
06/13	1	0.00	0.172	0.513
	2	0.00	0.169	0.512
06/14	1	0.00	0.169	0.503
	2	0.00	0.170	0.508
06/17	1	0.00	0.173	0.507
	2	0.00	0.172	0.504
06/18	1	0.00	0.173	0.505
	2	0.00	0.172	0.510
06/19	1	0.00	0.172	0.511
	2	0.00	0.173	0.507
06/20	1	0.00	0.173	0.511
	2	0.00	0.171	0.505
06/21	1	0.00	0.175	0.510
	2	0.00	0.172	0.507

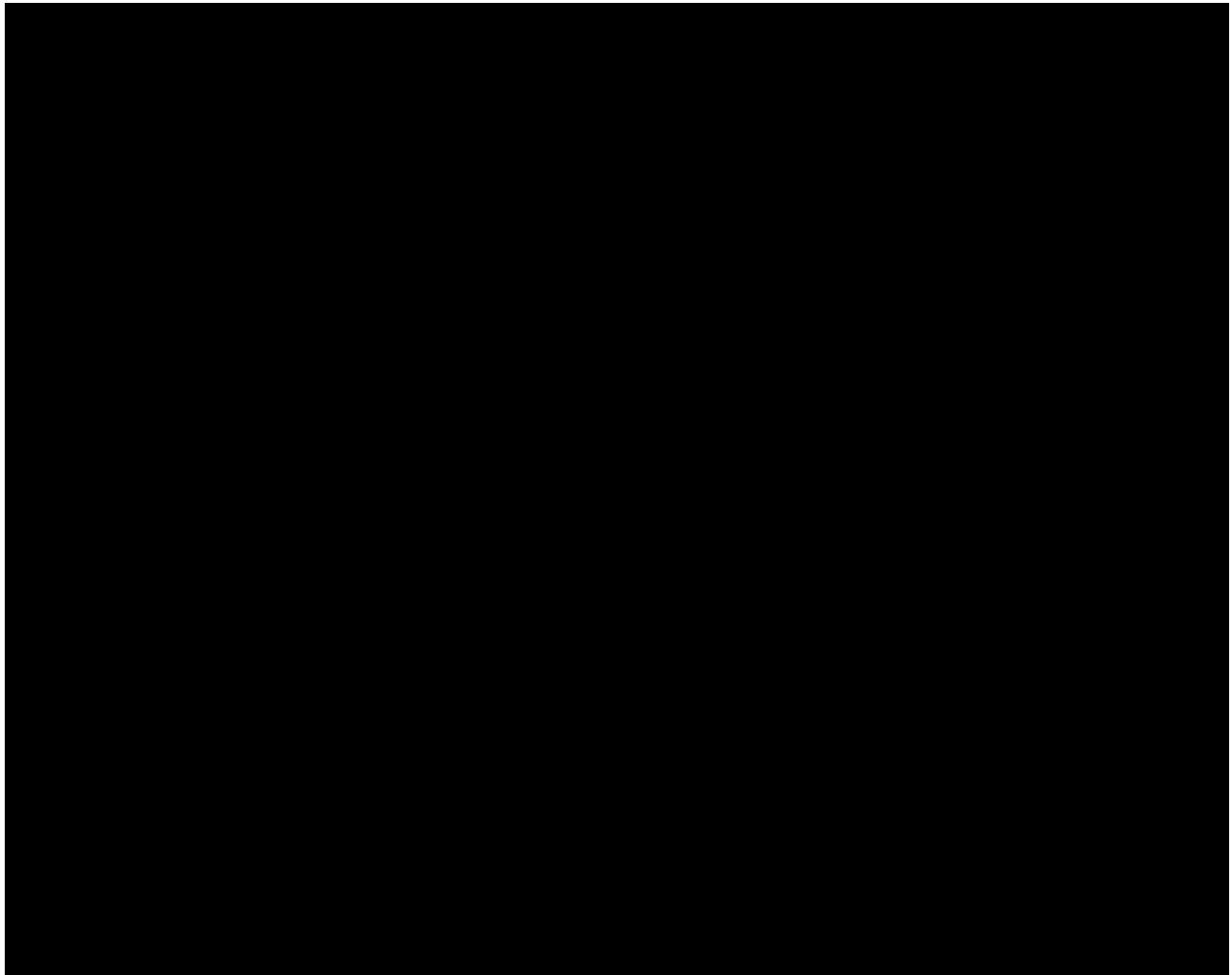
Appendix 2. Daily concentration of MWCNT (continued)

DAILY CONCENTRATION OF MWCNT					
		Group			
DAY	TIMES	Control	Low	Medium	High
06/24	1	0.00	0.172	0.506	0.988
	2	0.00	0.175	0.514	1.006
06/25	1	0.00	0.175	0.514	1.006
	2	0.00	0.176	0.533	0.991
06/26	1	0.00	0.175	0.520	0.991
	2	0.00	0.173	0.512	1.159
06/27	1	0.00	0.172	0.515	1.159
	2	0.00	0.176	0.518	1.160
06/28	1	0.00	0.171	0.512	0.994
	2	0.00	0.174	0.528	1.002
07/01	1	0.00	0.176	0.522	1.000
	2	0.00	0.176	0.520	1.000
07/02	1	0.00	0.171	0.518	0.831
	2	0.00	0.177	0.525	1.007
07/03	1	0.00	0.167	0.514	0.874
	2	0.00	0.169	0.517	1.026

Appendix 3. Daily distribution of particle in vehicle

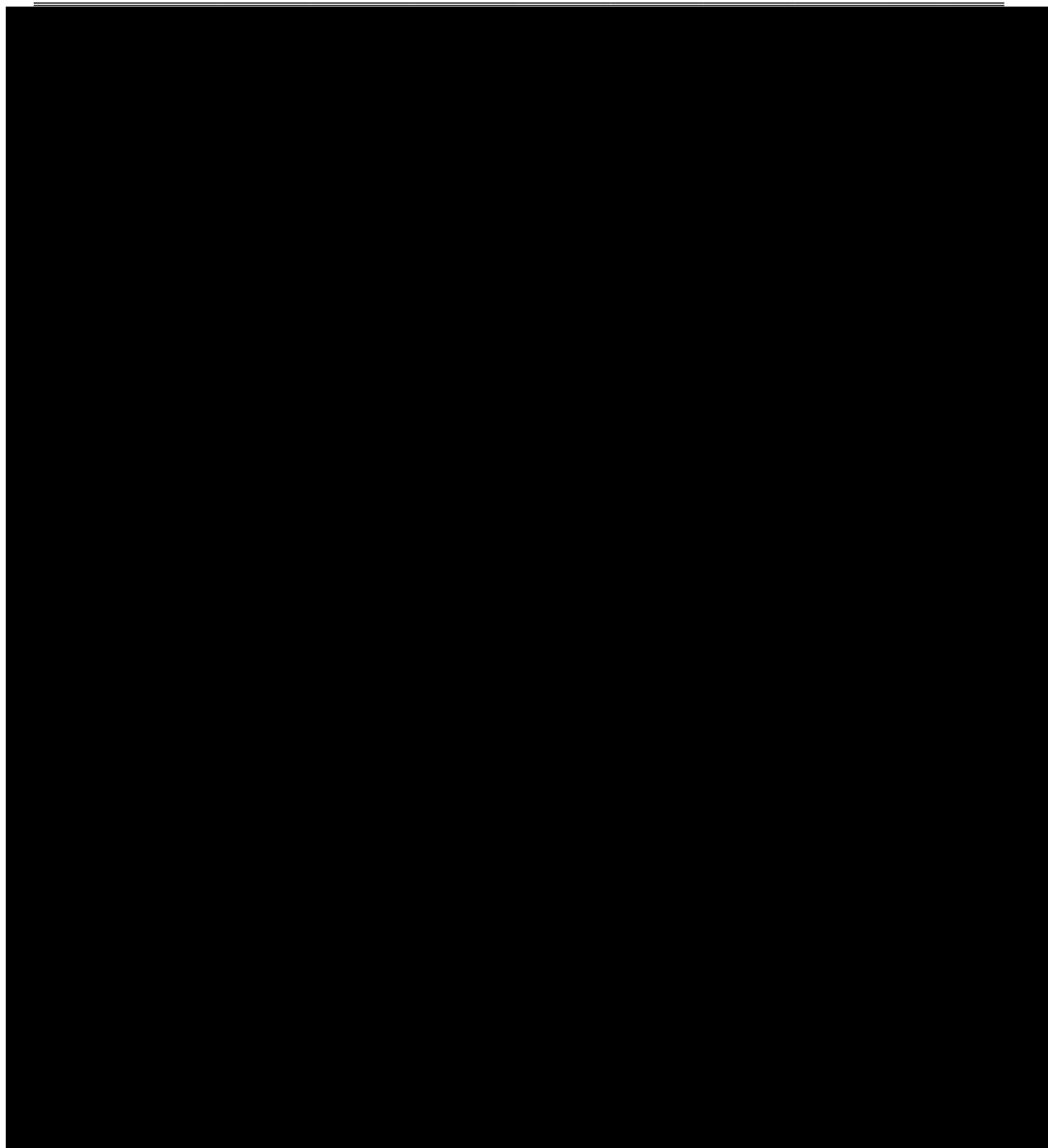
DAILY DISTRIBUTION OF PARTICLE IN VEHICLE

GT13-00174



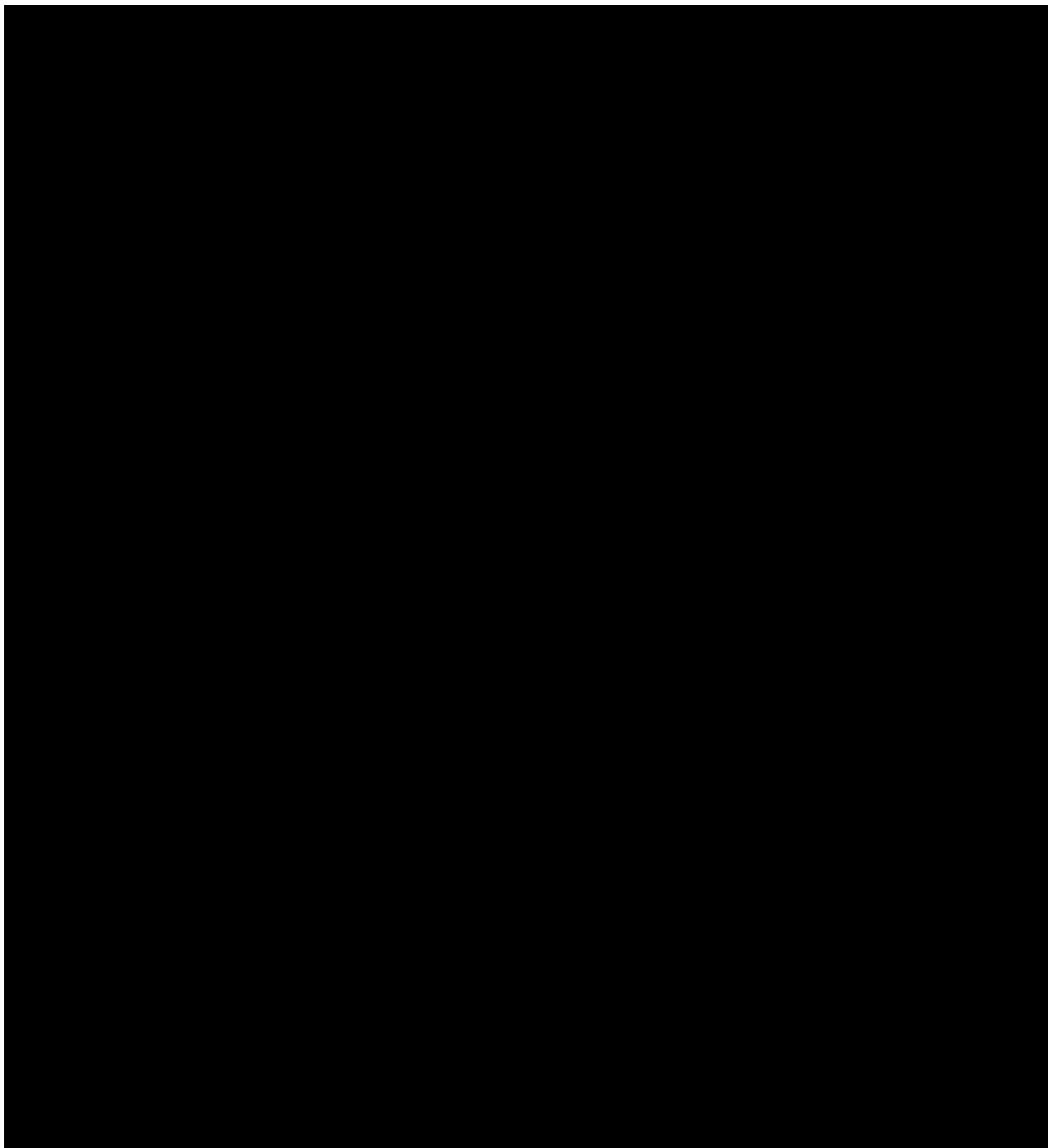
Appendix 4. The length of MWCNT by TEM

THE LENGTH OF MWCNT BY TEM



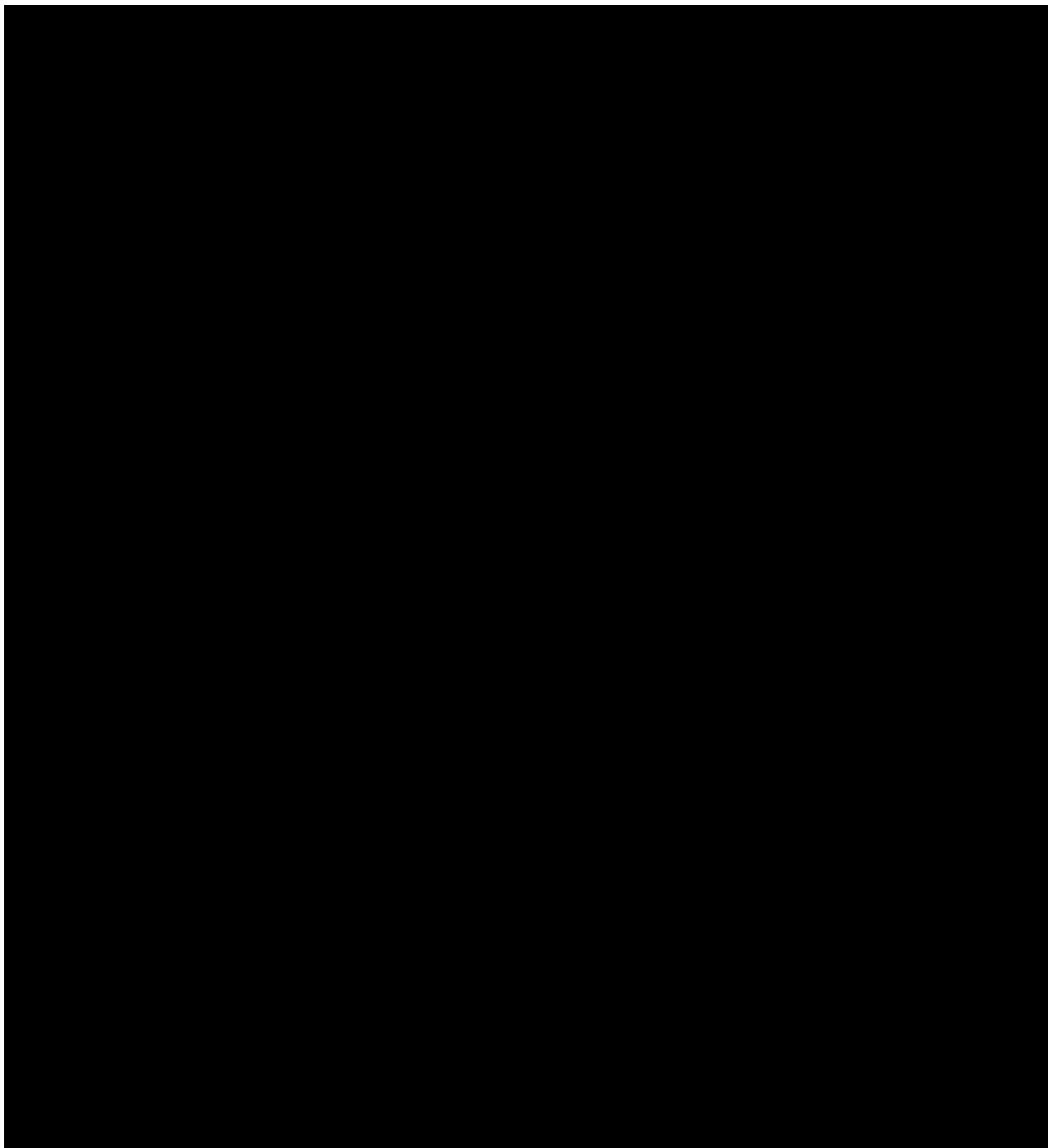
Appendix 4. The length of MWCNT by TEM (continued)

THE LENGTH OF MWCNT BY TEM



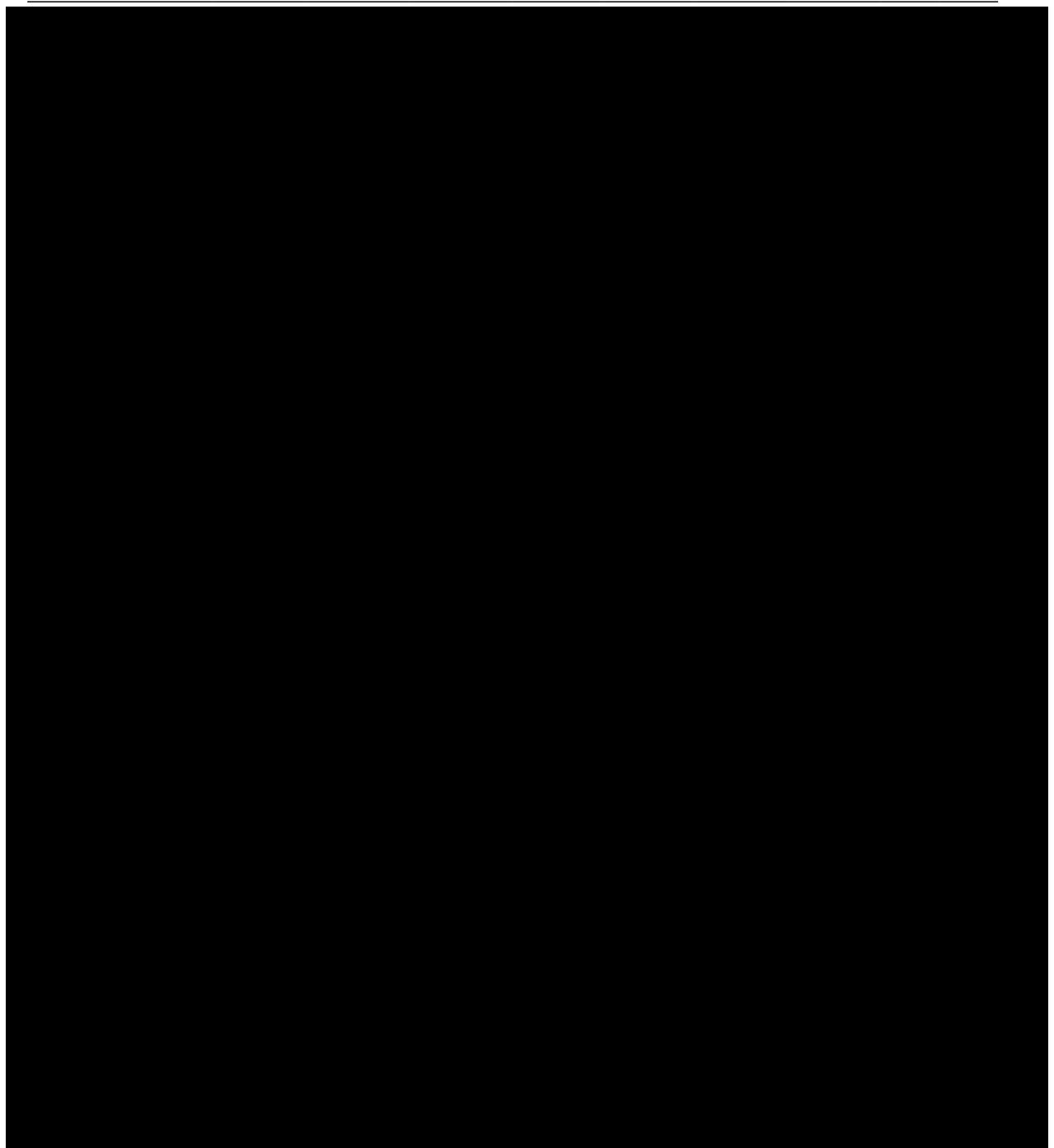
Appendix 4. The length of MWCNT by TEM (continued)

THE LENGTH OF MWCNT BY TEM



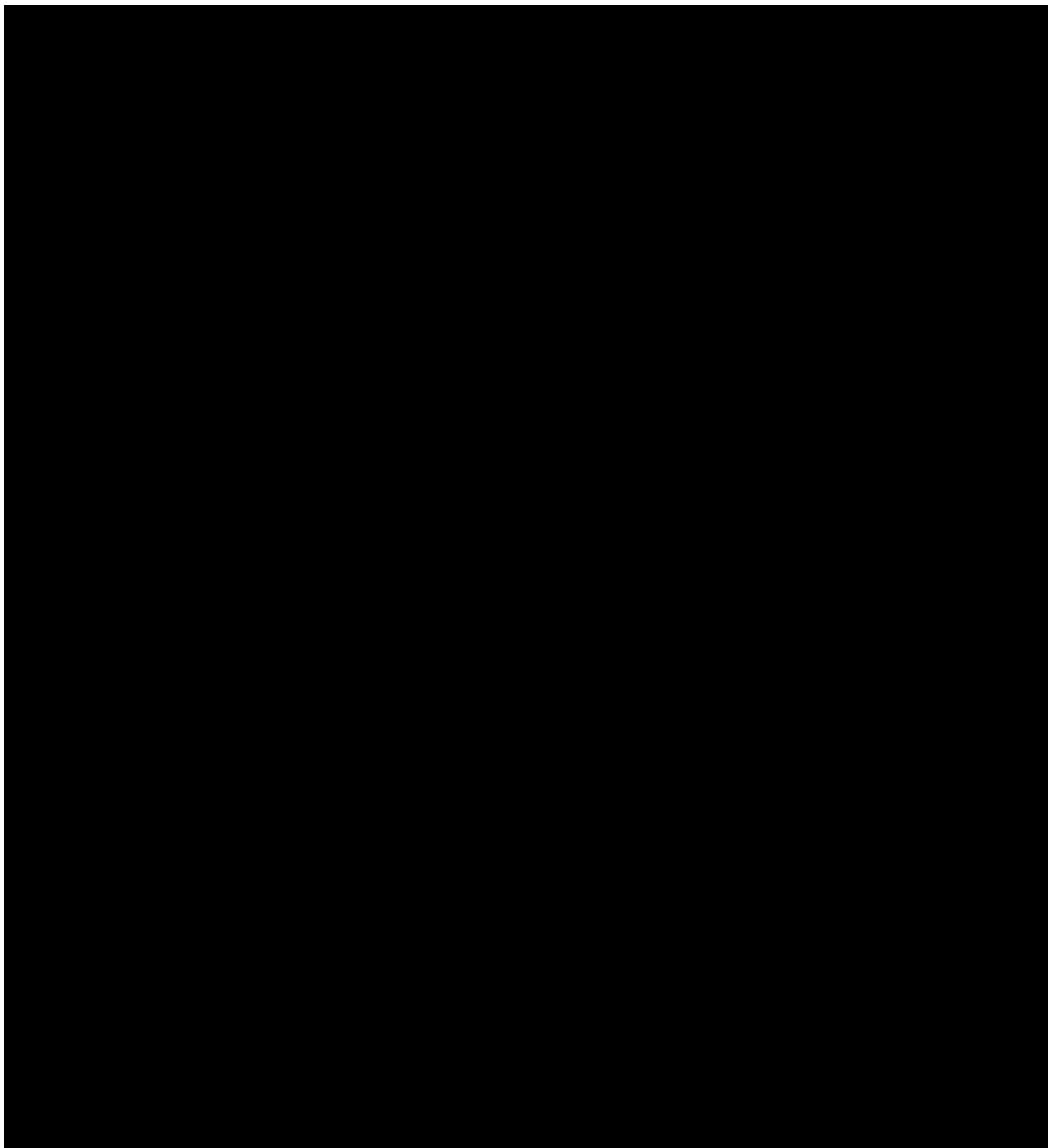
Appendix 4. The length of MWCNT by TEM (continued)

THE LENGTH OF MWCNT BY TEM



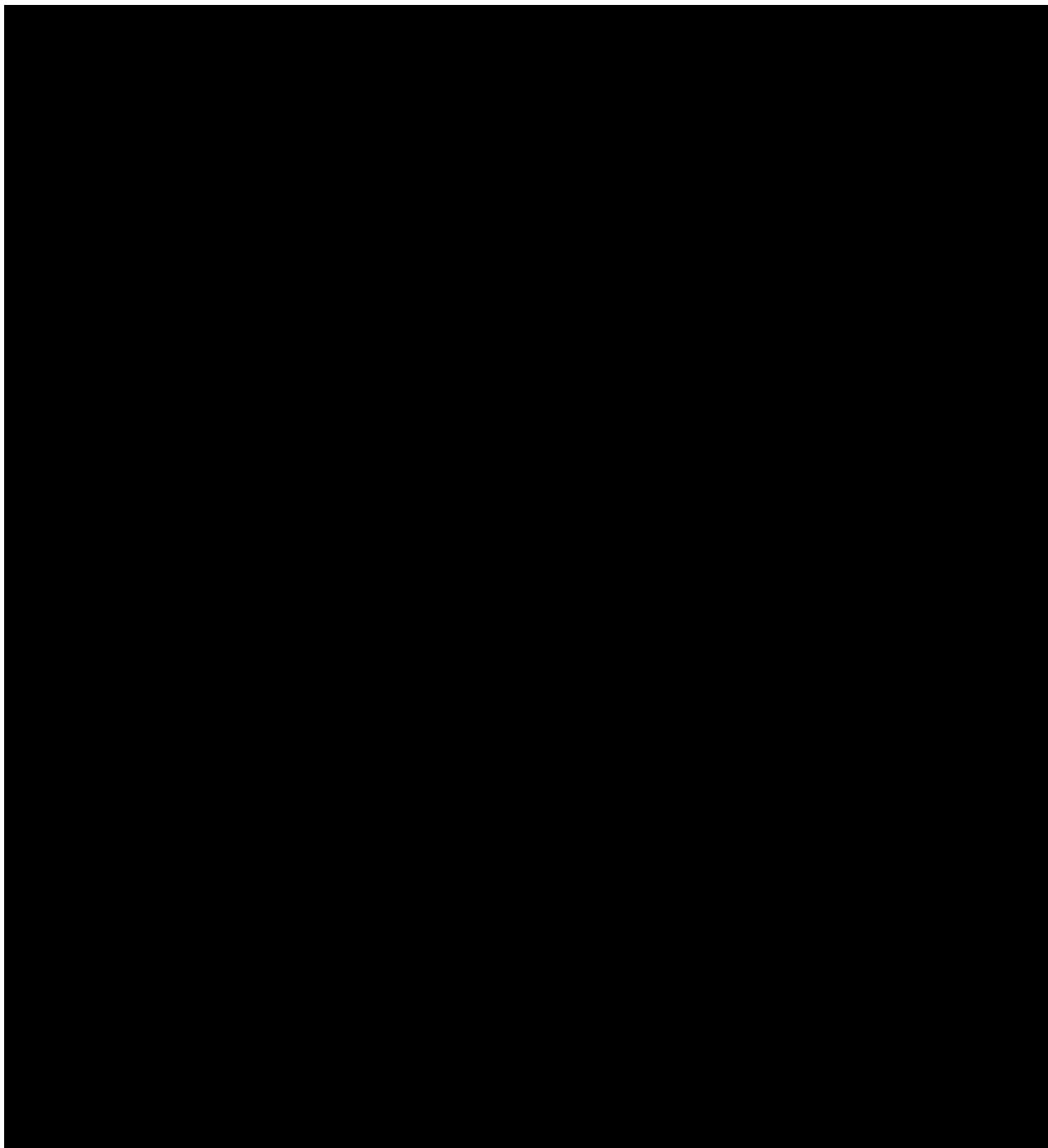
Appendix 4. The length of MWCNT by TEM (continued)

THE LENGTH OF MWCNT BY TEM



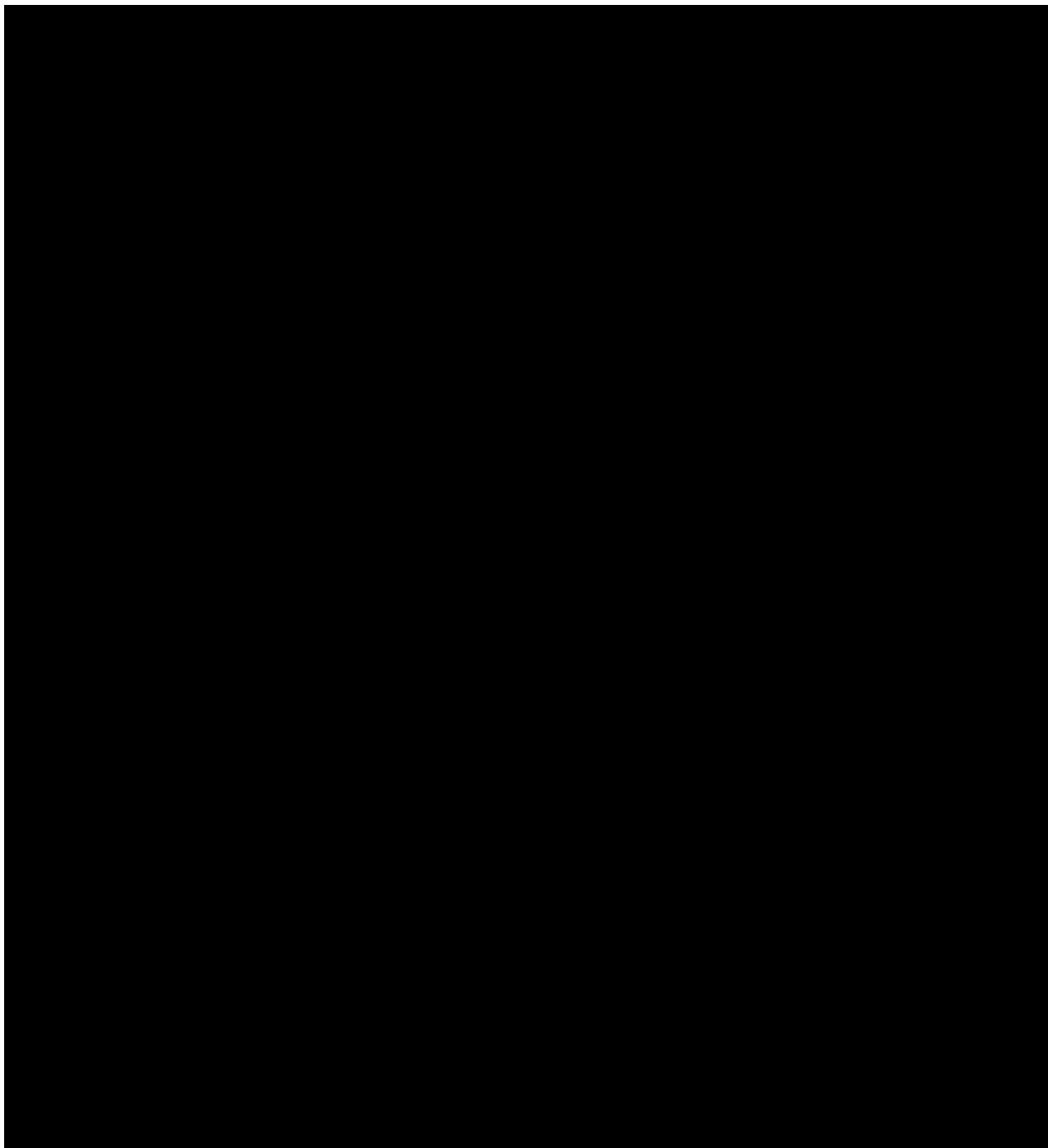
Appendix 4. The length of MWCNT by TEM (continued)

THE LENGTH OF MWCNT BY TEM



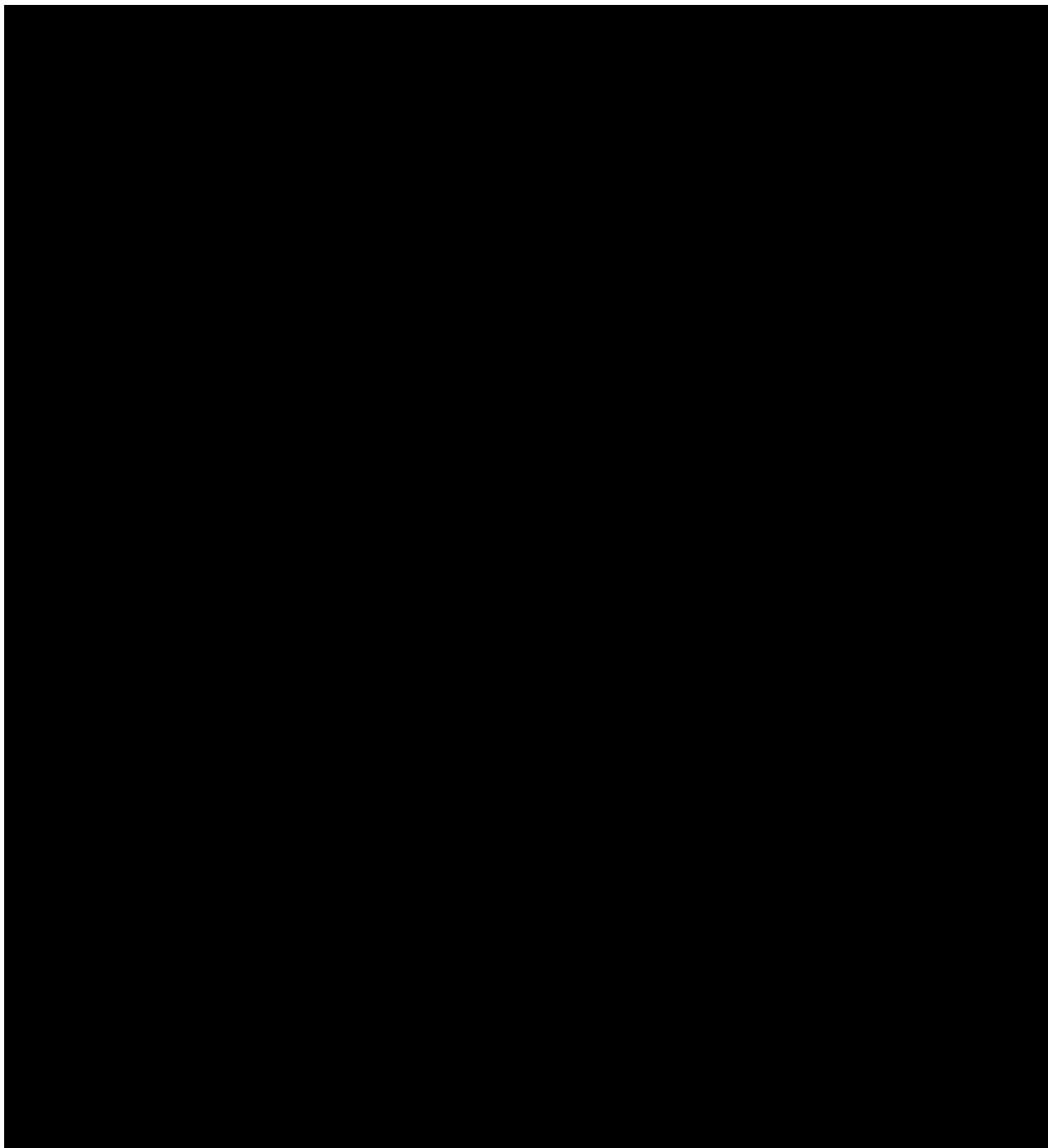
Appendix 4. The length of MWCNT by TEM (continued)

THE LENGTH OF MWCNT BY TEM



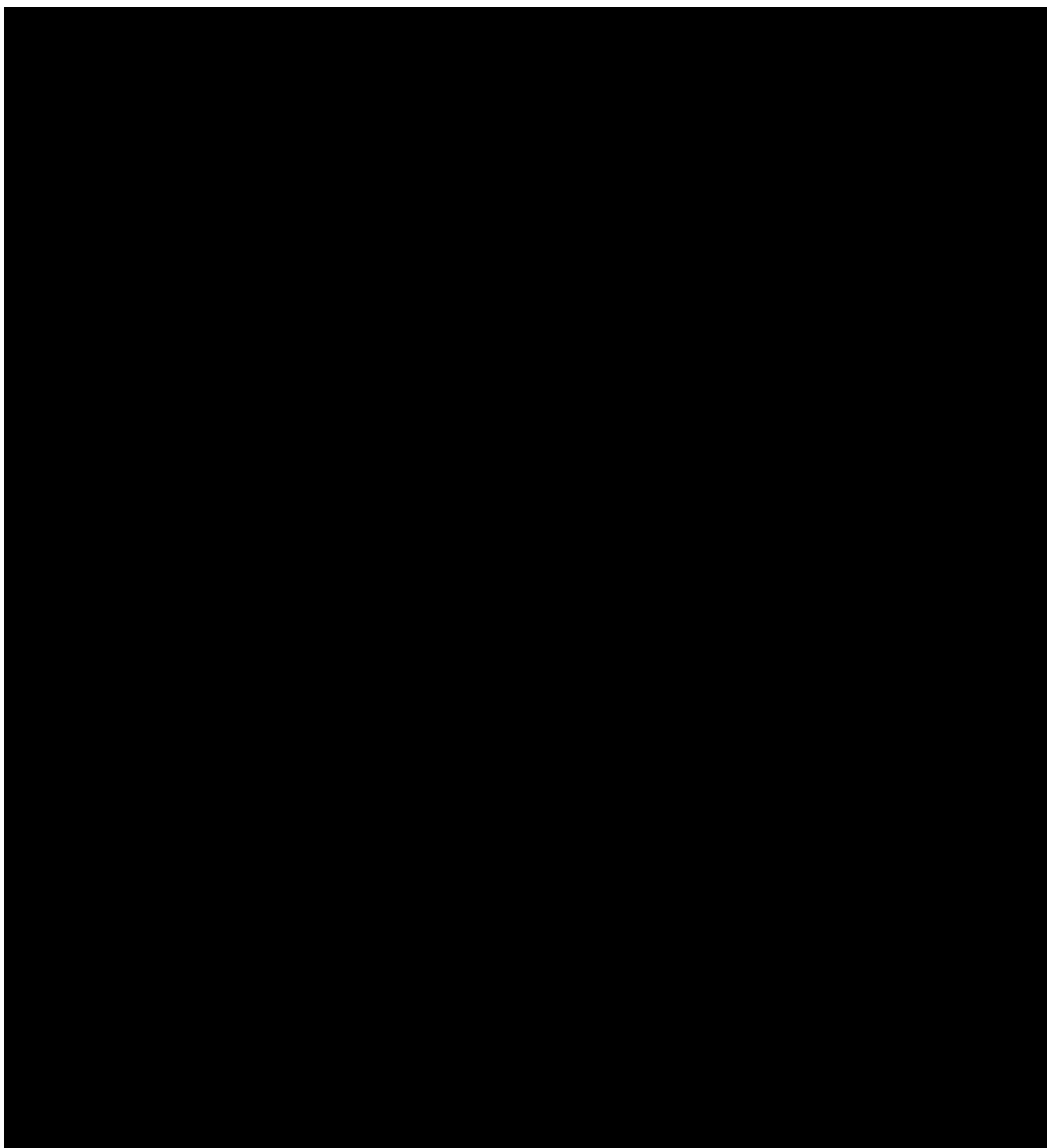
Appendix 4. The length of MWCNT by TEM (continued)

THE LENGTH OF MWCNT BY TEM



Appendix 4. The length of MWCNT by TEM (continued)

THE LENGTH OF MWCNT BY TEM



Appendix 5-1. Individual clinical signs in male rats

CLINICAL SIGNS INDIVIDUAL DATA		
GT13-00174		Sex : MALE
Animal No.	OBSERVATIONS	TIME OCCURED
C-1	Normal	0 - 28 Day
	Terminal sacrifice	28 Day
C-2	Normal	0 - 28 Day
	Terminal sacrifice	28 Day
C-3	Normal	0 - 28 Day
	Terminal sacrifice	28 Day
C-4	Normal	0 - 28 Day
	Terminal sacrifice	28 Day
C-5	Normal	0 - 28 Day
	Terminal sacrifice	28 Day
C-6	Normal	0 - 28 Day
	Terminal sacrifice	28 Day
C-7	Normal	0 - 28 Day
	Terminal sacrifice	28 Day
C-8	Normal	0 - 28 Day
	Terminal sacrifice	28 Day
C-9	Normal	0 - 28 Day
	Terminal sacrifice	28 Day
C-10	Normal	0 - 28 Day
	Terminal sacrifice	28 Day
L-11	Normal	0 - 28 Day
	Terminal sacrifice	28 Day
L-12	Normal	0 - 28 Day
	Terminal sacrifice	28 Day
L-13	Normal	0 - 28 Day
	Terminal sacrifice	28 Day
L-14	Normal	0 - 28 Day
	Terminal sacrifice	28 Day
L-15	Normal	0 - 28 Day
	Terminal sacrifice	28 Day
L-16	Normal	0 - 28 Day
	Terminal sacrifice	28 Day
L-17	Normal	0 - 28 Day
	Terminal sacrifice	28 Day
L-18	Normal	0 - 28 Day
	Terminal sacrifice	28 Day
L-19	Normal	0 - 28 Day
	Terminal sacrifice	28 Day
L-20	Normal	0 - 28 Day
	Terminal sacrifice	28 Day

Appendix 5-1. Individual clinical signs in male rats (continued)

CLINICAL SIGNS INDIVIDUAL DATA		
GT13-00174		Sex : MALE
Animal No.	OBSERVATIONS	TIME OCCURED
M-21	Normal	0 - 28 Day
	Terminal sacrifice	28 Day
M-22	Normal	0 - 28 Day
	Terminal sacrifice	28 Day
M-23	Normal	0 - 28 Day
	Terminal sacrifice	28 Day
M-24	Normal	0 - 28 Day
	Terminal sacrifice	28 Day
M-25	Normal	0 - 28 Day
	Terminal sacrifice	28 Day
M-26	Normal	0 - 28 Day
	Terminal sacrifice	28 Day
M-27	Normal	0 - 28 Day
	Terminal sacrifice	28 Day
M-28	Normal	0 - 28 Day
	Terminal sacrifice	28 Day
M-29	Normal	0 - 28 Day
	Terminal sacrifice	28 Day
M-30	Normal	0 - 28 Day
	Terminal sacrifice	28 Day
H-31	Normal	0 - 28 Day
	Terminal sacrifice	28 Day
H-32	Normal	0 - 28 Day
	Terminal sacrifice	28 Day
H-33	Normal	0 - 28 Day
	Terminal sacrifice	28 Day
H-34	Normal	0 - 28 Day
	Terminal sacrifice	28 Day
H-35	Normal	0 - 28 Day
	Terminal sacrifice	28 Day
H-36	Normal	0 - 28 Day
	Terminal sacrifice	28 Day
H-37	Normal	0 - 28 Day
	Terminal sacrifice	28 Day
H-38	Normal	0 - 28 Day
	Terminal sacrifice	28 Day
H-39	Normal	0 - 28 Day
	Terminal sacrifice	28 Day
H-40	Normal	0 - 28 Day
	Terminal sacrifice	28 Day

Appendix 5-2. Individual clinical signs in female rats

CLINICAL SIGNS INDIVIDUAL DATA		
GT13-00174		Sex : FEMALE
Animal No.	OBSERVATIONS	TIME OCCURED
C-41	Normal	0 - 28 Day
	Terminal sacrifice	28 Day
C-42	Normal	0 - 28 Day
	Terminal sacrifice	28 Day
C-43	Normal	0 - 28 Day
	Terminal sacrifice	28 Day
C-44	Normal	0 - 28 Day
	Terminal sacrifice	28 Day
C-45	Normal	0 - 28 Day
	Terminal sacrifice	28 Day
C-46	Normal	0 - 28 Day
	Terminal sacrifice	28 Day
C-47	Normal	0 - 22 Day
	Opacity of eyeball	23 - 28 Day
	Terminal sacrifice	28 Day
C-48	Normal	0 - 28 Day
	Terminal sacrifice	28 Day
C-49	Normal	0 - 28 Day
	Terminal sacrifice	28 Day
C-50	Normal	0 - 28 Day
	Terminal sacrifice	28 Day
L-51	Normal	0 - 28 Day
	Terminal sacrifice	28 Day
L-52	Normal	0 - 28 Day
	Terminal sacrifice	28 Day
L-53	Normal	0 - 28 Day
	Terminal sacrifice	28 Day
L-54	Normal	0 - 28 Day
	Terminal sacrifice	28 Day
L-55	Normal	0 - 28 Day
	Terminal sacrifice	28 Day
L-56	Normal	0 - 28 Day
	Terminal sacrifice	28 Day
L-57	Normal	0 - 28 Day
	Terminal sacrifice	28 Day
L-58	Normal	0 - 28 Day
	Terminal sacrifice	28 Day
L-59	Normal	0 - 28 Day
	Terminal sacrifice	28 Day
L-60	Normal	0 - 28 Day
	Terminal sacrifice	28 Day

Appendix 5-2. Individual clinical signs in female rats (continued)

CLINICAL SIGNS INDIVIDUAL DATA		
GT13-00174		Sex : FEMALE
Animal No.	OBSERVATIONS	TIME OCCURED
M-61	Normal	0 - 28 Day
	Terminal sacrifice	28 Day
M-62	Normal	0 - 28 Day
	Terminal sacrifice	28 Day
M-63	Normal	0 - 28 Day
	Terminal sacrifice	28 Day
M-64	Normal	0 - 28 Day
	Terminal sacrifice	28 Day
M-65	Normal	0 - 28 Day
	Terminal sacrifice	28 Day
M-66	Normal	0 - 28 Day
	Terminal sacrifice	28 Day
M-67	Normal	0 - 28 Day
	Terminal sacrifice	28 Day
M-68	Normal	0 - 28 Day
	Terminal sacrifice	28 Day
M-69	Normal	0 - 28 Day
	Terminal sacrifice	28 Day
M-70	Normal	0 - 28 Day
	Terminal sacrifice	28 Day
H-71	Normal	0 - 28 Day
	Terminal sacrifice	28 Day
H-72	Normal	0 - 28 Day
	Terminal sacrifice	28 Day
H-73	Normal	0 - 28 Day
	Terminal sacrifice	28 Day
H-74	Normal	0 - 28 Day
	Terminal sacrifice	28 Day
H-75	Normal	0 - 28 Day
	Terminal sacrifice	28 Day
H-76	Normal	0 - 28 Day
	Terminal sacrifice	28 Day
H-77	Normal	0 - 28 Day
	Terminal sacrifice	28 Day
H-78	Normal	0 - 28 Day
	Terminal sacrifice	28 Day
H-79	Normal	0 - 28 Day
	Terminal sacrifice	28 Day
H-80	Normal	0 - 28 Day
	Terminal sacrifice	28 Day

Appendix 6-1. Individual body weights in male rats

INDIVIDUAL BODY WEIGHTS (Grams)						
STUDY : GT13-00174		GROUP : Control			SEX : MALE	
ANIMAL #	0 DAY	1 Week	2 Week	3 Week	4 Week	Sacrifice
C-1	153.93	160.40	185.93	207.22	227.70	208.74
C-2	160.78	169.38	190.40	208.51	223.11	202.89
C-3	162.03	165.87	185.13	205.79	226.58	211.42
C-4	163.93	177.25	207.24	227.31	245.11	227.26
C-5	164.14	166.88	188.19	208.51	226.20	207.93
C-6	167.40	165.47	192.91	213.61	231.83	212.42
C-7	167.45	179.03	202.23	224.87	244.14	226.51
C-8	170.61	180.67	203.14	225.59	239.15	227.41
C-9	171.21	180.80	206.17	227.83	244.48	224.49
C-10	177.32	181.51	197.21	214.37	230.72	214.07
N	10	10	10	10	10	10

STUDY : GT13-00174		GROUP : Low			SEX : MALE	
ANIMAL #	0 DAY	1 Week	2 Week	3 Week	4 Week	Sacrifice
L-11	154.31	159.30	186.87	211.52	235.10	215.45
L-12	160.04	164.41	177.12	193.04	212.87	196.84
L-13	162.29	170.70	192.30	212.47	232.48	213.32
L-14	163.66	172.70	196.29	214.85	231.31	214.23
L-15	164.63	169.37	193.17	215.92	230.66	210.72
L-16	167.32	172.75	204.89	225.18	240.50	221.94
L-17	167.86	173.04	200.44	219.52	227.37	206.67
L-18	169.49	178.72	203.93	222.49	238.79	221.43
L-19	171.78	183.92	217.64	242.44	264.95	246.79
L-20	177.19	183.66	210.79	231.02	247.73	229.83
N	10	10	10	10	10	10

Appendix 6-1. Individual body weights in male rats (continued)

INDIVIDUAL BODY WEIGHTS (Grams)						
STUDY : GT13-00174		GROUP : Medium		SEX : MALE		
ANIMAL #	0 DAY	1 Week	2 Week	3 Week	4 Week	Sacrifice
M-21	155.73	159.75	177.29	194.33	210.65	195.54
M-22	159.08	162.92	187.51	207.84	224.69	204.91
M-23	162.47	170.95	199.98	218.22	238.86	219.39
M-24	163.06	168.54	192.18	210.14	227.75	209.00
M-25	164.76	168.37	180.69	195.32	215.41	198.90
M-26	166.85	173.36	193.25	217.05	242.13	224.26
M-27	168.03	178.81	204.74	225.65	248.65	230.41
M-28	169.46	169.70	195.01	221.59	249.71	230.95
M-29	173.12	179.36	194.03	206.93	224.44	210.02
M-30	175.94	182.66	200.72	214.77	222.58	206.29
N	10	10	10	10	10	10
STUDY : GT13-00174		GROUP : High		SEX : MALE		
ANIMAL #	0 DAY	1 Week	2 Week	3 Week	4 Week	Sacrifice
H-31	157.74	146.55	181.09	207.07	231.61	207.59
H-32	158.91	164.39	188.37	210.18	230.17	211.02
H-33	162.63	166.59	186.07	199.36	215.50	197.02
H-34	162.75	168.99	199.83	221.11	240.65	214.87
H-35	165.75	172.84	198.58	209.89	229.55	208.86
H-36	166.25	175.67	200.52	214.10	230.66	212.60
H-37	168.12	173.88	191.91	204.56	221.77	205.39
H-38	168.40	171.44	199.61	220.06	244.22	227.38
H-39	173.77	181.20	210.51	232.78	241.11	225.42
H-40	174.29	180.89	210.30	232.37	253.96	236.36
N	10	10	10	10	10	10

Appendix 6-2. Individual body weights in female rats

INDIVIDUAL BODY WEIGHTS (Grams)						
STUDY : GT13-00174		GROUP : Control		SEX : FEMALE		
ANIMAL #	0 DAY	1 Week	2 Week	3 Week	4 Week	Sacrifice
C-41	129.49	127.28	134.33	139.78	144.21	128.95
C-42	132.87	132.26	137.65	143.03	151.35	133.45
C-43	133.36	129.80	132.20	137.56	142.19	127.52
C-44	135.84	135.23	141.10	142.01	147.42	134.54
C-45	137.28	130.66	129.49	137.02	144.50	130.80
C-46	138.95	135.24	140.15	144.59	151.28	136.96
C-47	139.87	140.89	140.68	145.87	146.58	137.40
C-48	142.97	145.83	151.78	153.02	150.87	137.21
C-49	143.22	142.86	144.82	148.27	151.18	140.25
C-50	150.89	152.65	154.96	153.86	158.93	143.26
N	10	10	10	10	10	10

STUDY : GT13-00174		GROUP : Low		SEX : FEMALE		
ANIMAL #	0 DAY	1 Week	2 Week	3 Week	4 Week	Sacrifice
L-51	129.52	129.13	132.73	136.65	138.98	125.40
L-52	132.31	130.60	133.65	134.54	139.96	124.87
L-53	133.80	136.26	140.46	143.41	145.34	128.65
L-54	135.79	136.05	141.15	140.61	141.97	129.02
L-55	137.92	136.21	142.44	140.54	140.84	126.54
L-56	138.94	143.44	144.70	149.44	151.69	138.12
L-57	140.23	138.54	142.59	149.23	150.21	136.83
L-58	142.90	141.20	146.45	150.43	155.20	140.59
L-59	143.28	142.74	146.28	151.35	153.12	138.59
L-60	143.24	141.15	142.16	140.41	142.87	127.96
N	10	10	10	10	10	10

Appendix 6-2. Individual body weights in female rats (continued)

INDIVIDUAL BODY WEIGHTS (Grams)						
STUDY : GT13-00174		GROUP : Medium		SEX : FEMALE		
ANIMAL #	0 DAY	1 Week	2 Week	3 Week	4 Week	Sacrifice
M-61	130.05	129.19	130.88	132.60	136.58	125.99
M-62	132.17	132.66	137.67	142.51	143.53	129.48
M-63	135.04	137.76	146.31	147.35	153.36	136.12
M-64	135.74	132.64	137.06	138.18	145.94	131.52
M-65	138.29	136.03	141.54	146.62	152.13	138.16
M-66	138.87	135.27	140.75	141.07	140.08	123.32
M-67	140.70	139.49	151.91	154.67	159.74	142.26
M-68	142.61	145.77	147.88	151.66	157.35	142.20
M-69	143.46	139.96	145.26	147.92	156.46	139.15
M-70	145.04	145.01	154.36	159.83	166.87	149.56
N	10	10	10	10	10	10
STUDY : GT13-00174		GROUP : High		SEX : FEMALE		
ANIMAL #	0 DAY	1 Week	2 Week	3 Week	4 Week	Sacrifice
H-71	130.65	132.92	138.89	140.79	146.87	133.58
H-72	132.09	134.35	140.09	146.39	150.61	132.85
H-73	135.11	137.38	141.62	140.27	142.99	128.24
H-74	135.53	129.51	133.90	134.82	140.86	128.57
H-75	138.78	139.59	147.73	152.02	161.20	144.01
H-76	138.86	135.79	137.32	141.55	147.99	134.24
H-77	140.76	142.05	146.99	153.35	157.83	142.12
H-78	142.48	138.63	144.92	148.97	159.45	143.25
H-79	143.53	137.10	139.69	141.48	142.77	129.83
H-80	144.37	140.70	142.05	141.21	138.99	124.48
N	10	10	10	10	10	10

Appendix 7-1. Individual food consumption in male rats

INDIVIDUAL FOOD CONSUMPTION (Grams)				
ANIMAL #	1 Week	2 Week	3 Week	4 Week
C-1	14.58	18.07	18.17	17.46
C-2	20.06	17.38	17.36	15.48
C-3	16.08	15.58	17.42	16.28
C-4	18.24	19.57	18.33	17.89
C-5	16.46	15.84	16.88	17.02
C-6	15.16	17.37	19.04	16.78
C-7	18.00	17.57	17.89	17.32
C-8	18.75	17.77	19.60	18.93
C-9	18.06	17.71	18.12	17.81
C-10	20.41	15.36	16.60	16.07
N	10	10	10	10
STUDY : GT13-00174				
GROUP : Control				
DOSE : 0 mg/m³				
ANIMAL #	1 Week	2 Week	3 Week	4 Week
L-11	15.32	17.20	19.70	19.47
L-12	15.98	14.32	15.22	16.17
L-13	16.50	17.63	18.03	18.27
L-14	17.91	18.23	17.36	19.53
L-15	18.76	16.53	20.09	16.51
L-16	17.16	18.70	18.76	18.43
L-17	21.01	18.82	18.48	17.28
L-18	18.36	20.83	20.89	18.21
L-19	19.79	22.69	22.16	21.15
L-20	19.79	18.10	17.05	19.19
N	10	10	10	10

Appendix 7-1. Individual food consumption in male rats (continued)

INDIVIDUAL FOOD CONSUMPTION (Grams)				
ANIMAL #	1 Week	2 Week	3 Week	4 Week
M-21	16.54	12.89	17.26	17.25
M-22	17.22	16.94	17.91	18.40
M-23	18.94	21.73	18.04	18.45
M-24	18.04	18.35	19.76	17.95
M-25	16.90	15.10	15.62	15.26
M-26	15.72	18.66	16.99	19.79
M-27	20.34	19.40	17.46	20.02
M-28	17.10	17.91	19.75	23.50
M-29	19.83	16.28	16.58	20.09
M-30	17.93	17.88	17.89	15.34
N	10	10	10	10
STUDY : GT13-00174	GROUP : Medium	SEX : MALE		
	DOSE : 0.5 mg/m³			
ANIMAL #	1 Week	2 Week	3 Week	4 Week
H-31	1.32	18.90	17.79	19.49
H-32	12.41	17.16	17.62	18.74
H-33	15.88	17.61	16.18	16.27
H-34	16.54	18.50	18.87	18.39
H-35	17.43	19.54	17.55	19.50
H-36	18.09	17.11	15.85	17.56
H-37	16.37	16.98	16.86	18.73
H-38	14.61	19.01	19.20	20.01
H-39	17.52	20.90	20.91	20.17
H-40	19.70	20.07	22.37	20.13
N	10	10	10	10

Appendix 7-2. Individual food consumption in female rats

INDIVIDUAL FOOD CONSUMPTION (Grams)				
ANIMAL #	1 Week	2 Week	3 Week	4 Week
C-41	10.54	11.74	9.89	9.93
C-42	9.84	10.37	12.74	10.85
C-43	12.95	10.50	10.83	10.76
C-44	9.55	12.34	11.91	10.63
C-45	10.73	9.42	10.87	10.51
C-46	11.59	10.09	10.49	11.55
C-47	12.96	11.27	11.44	8.56
C-48	12.31	11.98	11.88	10.08
C-49	11.07	10.03	10.47	10.82
C-50	11.92	10.41	12.45	11.19
N	10	10	10	10
STUDY : GT13-00174				
GROUP : Control				
DOSE : 0 mg/m³				
ANIMAL #	1 Week	2 Week	3 Week	4 Week
L-51	10.36	10.43	9.94	9.98
L-52	12.69	11.21	10.10	11.00
L-53	12.39	11.22	10.94	11.00
L-54	10.15	11.58	10.13	8.20
L-55	12.52	11.40	10.46	9.07
L-56	14.11	13.89	13.12	9.20
L-57	9.39	10.64	12.92	9.34
L-58	10.09	12.57	11.12	9.89
L-59	10.80	10.81	11.13	12.63
L-60	12.52	11.49	9.18	9.50
N	10	10	10	10

Appendix 7-2. Individual food consumption in female rats (continued)

INDIVIDUAL FOOD CONSUMPTION (Grams)				
ANIMAL #	1 Week	2 Week	3 Week	4 Week
M-61	10.69	9.98	8.98	9.94
M-62	13.08	12.51	12.30	10.40
M-63	13.27	15.27	8.35	10.85
M-64	9.56	9.81	8.13	11.08
M-65	14.07	11.39	4.14	10.24
M-66	10.69	10.85	4.79	9.16
M-67	11.45	17.06	20.04	12.11
M-68	11.35	11.72	10.09	11.58
M-69	10.58	12.80	10.81	12.16
M-70	13.74	14.82	10.46	11.40
N	10	10	10	10
STUDY : GT13-00174	GROUP : Medium	SEX : FEMALE		
	DOSE : 0.5 mg/m³			
ANIMAL #	1 Week	2 Week	3 Week	4 Week
H-71	12.86	13.34	10.56	11.62
H-72	10.64	11.70	11.53	11.49
H-73	12.84	12.02	9.02	9.51
H-74	11.14	12.48	10.70	11.17
H-75	13.35	12.31	11.69	13.00
H-76	8.29	9.59	10.93	11.93
H-77	12.79	11.67	12.69	13.45
H-78	10.01	12.22	10.80	11.95
H-79	9.87	11.28	11.62	12.07
H-80	11.60	12.44	9.23	10.47
N	10	10	10	10

Appendix 8-1. Individual urinalysis in male rats

INDIVIDUAL URINALYSIS										
STUDY : GT13-00174			GROUP : Control DOSE : 0 mg/m³					SEX : MALE		
ANIMAL ID	GLU ¹	BIL ²	KET ³	SG ⁴	BLO ⁵	Ph ⁶	PRO ⁷	URO ⁸	NIT ⁹	LEU ¹⁰
C-1	negative	negative	trace	1.015	negative	6.0	2+	1.0	positive	negative
C-2	negative	negative	1+	1.020	trace	7.0	2+	0.2	negative	trace
C-3	negative	negative	1+	1.015	negative	6.0	2+	0.2	negative	trace
C-4	negative	negative	1+	1.030	negative	6.0	2+	1.0	negative	trace
C-5	negative	negative	trace	1.010	negative	6.5	1+	0.2	negative	trace
N	5	5	5	5	5	5	5	5	5	5
STUDY : GT13-00174			GROUP : Low DOSE : 0.2 mg/m³					SEX : MALE		
ANIMAL ID	GLU ¹	BIL ²	KET ³	SG ⁴	BLO ⁵	Ph ⁶	PRO ⁷	URO ⁸	NIT ⁹	LEU ¹⁰
L-11	negative	negative	negative	1.010	negative	6.5	2+	0.2	negative	trace
L-12	negative	negative	negative	1.010	trace	7.5	2+	0.2	negative	trace
L-13	negative	negative	1+	1.025	negative	7.0	2+	1.0	negative	trace
L-14	negative	negative	1+	1.015	negative	7.0	2+	1.0	negative	trace
L-15	negative	negative	trace	1.020	negative	6.0	2+	1.0	negative	trace
N	5	5	5	5	5	5	5	5	5	5
STUDY : GT13-00174			GROUP : Medium DOSE : 0.5 mg/m³					SEX : MALE		
ANIMAL ID	GLU ¹	BIL ²	KET ³	SG ⁴	BLO ⁵	Ph ⁶	PRO ⁷	URO ⁸	NIT ⁹	LEU ¹⁰
M-21	negative	negative	negative	1.015	trace	7.5	2+	0.2	negative	trace
M-22	negative	negative	1+	1.025	negative	6.0	2+	1.0	positive	trace
M-23	negative	negative	trace	1.015	negative	6.0	2+	1.0	negative	trace
M-24	negative	negative	trace	1.010	negative	6.0	2+	1.0	negative	trace
M-25	negative	negative	1+	1.030	negative	5.5	2+	1.0	negative	trace
N	5	5	5	5	5	5	5	5	5	5
STUDY : GT13-00174			GROUP : High DOSE : 1.0 mg/m³					SEX : MALE		
ANIMAL ID	GLU ¹	BIL ²	KET ³	SG ⁴	BLO ⁵	Ph ⁶	PRO ⁷	URO ⁸	NIT ⁹	LEU ¹⁰
H-31	negative	negative	trace	1.030	negative	6.0	2+	1.0	negative	trace
H-32	negative	negative	1+	1.015	negative	6.0	2+	1.0	negative	trace
H-33	negative	negative	1+	1.020	negative	6.5	2+	1.0	positive	trace
H-34	negative	negative	negative	1.015	negative	6.0	2+	1.0	positive	trace
H-35	negative	negative	1+	1.020	negative	6.0	2+	1.0	negative	trace
N	5	5	5	5	5	5	5	5	5	5

1, Glucose; 2, Bilirubin; 3, Ketone; 4, Specific gravity; 5, Blood; 6, potential of hydrogen; 7, Protein; 8, Urobilinogen; 9, Nitrite; 10, Leukocyte

Appendix 8-2. Individual urinalysis in female rats

INDIVIDUAL URINALYSIS										
STUDY : GT13-00174				GROUP : Control DOSE : 0 mg/m³				SEX : FEMALE		
ANIMAL ID	GLU ¹	BIL ²	KET ³	SG ⁴	BLO ⁵	Ph ⁶	PRO ⁷	URO ⁸	NIT ⁹	LEU ¹⁰
C-41	negative	negative	negative	1.01	negative	7.5	trace	0.2	negative	negative
C-42	negative	negative	negative	1.015	negative	7.0	1+	0.2	positive	negative
C-43	negative	negative	negative	1.010	negative	7.5	negative	0.2	positive	negative
C-44	negative	negative	negative	1.005	negative	7.5	negative	0.2	negative	negative
C-45	negative	negative	negative	1.005	negative	7.5	negative	0.2	negative	negative
N	5	5	5	5	5	5	5	5	5	5
STUDY : GT13-00174				GROUP : Low DOSE : 0.2 mg/m³				SEX : FEMALE		
ANIMAL ID	GLU ¹	BIL ²	KET ³	SG ⁴	BLO ⁵	Ph ⁶	PRO ⁷	URO ⁸	NIT ⁹	LEU ¹⁰
L-51	negative	negative	negative	1.010	negative	7.0	1+	1	negative	negative
L-52	negative	negative	trace	1.015	negative	7.5	1+	1	negative	negative
L-53	negative	negative	negative	1.010	negative	7.5	trace	0.2	negative	negative
L-54	negative	negative	negative	1.005	negative	7.5	1+	0.2	negative	negative
L-55	negative	negative	negative	1.01	negative	7.5	negative	0.2	positive	negative
N	5	5	5	5	5	5	5	5	5	5
STUDY : GT13-00174				GROUP : Medium DOSE : 0.5 mg/m³				SEX : FEMALE		
ANIMAL ID	GLU ¹	BIL ²	KET ³	SG ⁴	BLO ⁵	Ph ⁶	PRO ⁷	URO ⁸	NIT ⁹	LEU ¹⁰
M-61	negative	negative	negative	1.015	negative	7.5	trace	0.2	positive	negative
M-62	negative	negative	negative	1.005	negative	8.0	negative	0.2	negative	negative
M-63	negative	negative	negative	1.005	negative	7.5	negative	0.2	negative	negative
M-64	negative	negative	negative	1.010	negative	8.0	negative	0.2	negative	negative
M-65	negative	negative	negative	1.010	negative	7.5	negative	0.2	negative	negative
N	5	5	5	5	5	5	5	5	5	5
STUDY : GT13-00174				GROUP : High DOSE : 1.0 mg/m³				SEX : FEMALE		
ANIMAL ID	GLU ¹	BIL ²	KET ³	SG ⁴	BLO ⁵	Ph ⁶	PRO ⁷	URO ⁸	NIT ⁹	LEU ¹⁰
H-71	negative	negative	negative	1.01	negative	7.5	negative	0.2	negative	negative
H-72	negative	negative	negative	1.015	negative	7.0	negative	0.2	negative	negative
H-73	negative	negative	negative	1.010	negative	7.5	negative	0.2	positive	negative
H-74	negative	negative	negative	1.010	negative	7.5	1+	0.2	positive	negative
H-75	negative	negative	negative	1.005	negative	7.5	negative	0.2	negative	negative
N	5	5	5	5	5	5	5	5	5	5

1, Glucose; 2, Bilirubin; 3, Ketone; 4, Specific gravity; 5, Blood; 6, potential of hydrogen; 7, Protein; 8, Urobilinogen; 9, Nitrite; 10, Leukocyte

Appendix 9-1. Individual gross findings in male rats

INDIVIDUAL GROSS FINDINGS				
ANIMAL	FATE	DAY	LOCATION	OBSERVATION
C-1	Terminal sacrifice	28		normal
C-2	Terminal sacrifice	28		normal
C-3	Terminal sacrifice	28		normal
C-4	Terminal sacrifice	28		normal
C-5	Terminal sacrifice	28		normal
C-6	Terminal sacrifice	28		normal
C-7	Terminal sacrifice	28		normal
C-8	Terminal sacrifice	28		normal
C-9	Terminal sacrifice	28		normal
C-10	Terminal sacrifice	28		normal
STUDY ID : GT13-00174 GROUP : Control DOSE : 0 mg/m ³				
STUDY ID : GT13-00174 GROUP : Low DOSE : 0.2 mg/m ³				
ANIMAL	FATE	DAY	LOCATION	OBSERVATION
L-11	Terminal sacrifice	28		normal
L-12	Terminal sacrifice	28		normal
L-13	Terminal sacrifice	28		normal
L-14	Terminal sacrifice	28		normal
L-15	Terminal sacrifice	28		normal
L-16	Terminal sacrifice	28		normal
L-17	Terminal sacrifice	28		normal
L-18	Terminal sacrifice	28		normal
L-19	Terminal sacrifice	28		normal
L-20	Terminal sacrifice	28		normal

Appendix 9-1. Individual gross findings in male rats (continued)

INDIVIDUAL GROSS FINDINGS				
STUDY ID : GT13-00174		GROUP : Medium		SEX : MALE
ANIMAL	FATE	DAY	LOCATION	OBSERVATION
M-21	Terminal sacrifice	28		normal
M-22	Terminal sacrifice	28		normal
M-23	Terminal sacrifice	28		normal
M-24	Terminal sacrifice	28		normal
M-25	Terminal sacrifice	28		normal
M-26	Terminal sacrifice	28		normal
M-27	Terminal sacrifice	28		normal
M-28	Terminal sacrifice	28		normal
M-29	Terminal sacrifice	28		normal
M-30	Terminal sacrifice	28		normal

STUDY ID : GT13-00174		GROUP : High		SEX : MALE
ANIMAL	FATE	DAY	LOCATION	OBSERVATION
H-31	Terminal sacrifice	28		normal
H-32	Terminal sacrifice	28		normal
H-33	Terminal sacrifice	28		normal
H-34	Terminal sacrifice	28		normal
H-35	Terminal sacrifice	28		normal
H-36	Terminal sacrifice	28		normal
H-37	Terminal sacrifice	28		normal
H-38	Terminal sacrifice	28		normal
H-39	Terminal sacrifice	28		normal
H-40	Terminal sacrifice	28		normal

Appendix 9-2. Individual gross findings in female rats

INDIVIDUAL GROSS FINDINGS				
ANIMAL	FATE	DAY	LOCATION	OBSERVATION
C-41	Terminal sacrifice	28		normal
C-42	Terminal sacrifice	28		normal
C-43	Terminal sacrifice	28		normal
C-44	Terminal sacrifice	28		normal
C-45	Terminal sacrifice	28		normal
C-46	Terminal sacrifice	28		normal
C-47	Terminal sacrifice	28	eye(right)	opacity
C-48	Terminal sacrifice	28		normal
C-49	Terminal sacrifice	28		normal
C-50	Terminal sacrifice	28		normal

STUDY ID : GT13-00174	GROUP : Control	SEX : FEMALE		
ANIMAL	FATE	DAY	LOCATION	OBSERVATION
L-51	Terminal sacrifice	28		normal
L-52	Terminal sacrifice	28		normal
L-53	Terminal sacrifice	28		normal
L-54	Terminal sacrifice	28		normal
L-55	Terminal sacrifice	28		normal
L-56	Terminal sacrifice	28		normal
L-57	Terminal sacrifice	28		normal
L-58	Terminal sacrifice	28		normal
L-59	Terminal sacrifice	28		normal
L-60	Terminal sacrifice	28		normal

Appendix 9-2. Individual gross findings in female rats (continued)

INDIVIDUAL GROSS FINDINGS				
STUDY ID : GT13-00174		GROUP : Medium		SEX : FEMALE
ANIMAL	FATE	DAY	LOCATION	OBSERVATION
M-61	Terminal sacrifice	28		normal
M-62	Terminal sacrifice	28		normal
M-63	Terminal sacrifice	28		normal
M-64	Terminal sacrifice	28		normal
M-65	Terminal sacrifice	28		normal
M-66	Terminal sacrifice	28		normal
M-67	Terminal sacrifice	28		normal
M-68	Terminal sacrifice	28		normal
M-69	Terminal sacrifice	28		normal
M-70	Terminal sacrifice	28		normal

STUDY ID : GT13-00174		GROUP : High	SEX : FEMALE	
		DOSE : 1.0 mg/m ³		
ANIMAL	FATE	DAY	LOCATION	OBSERVATION
H-71	Terminal sacrifice	28		normal
H-72	Terminal sacrifice	28		normal
H-73	Terminal sacrifice	28		normal
H-74	Terminal sacrifice	28		normal
H-75	Terminal sacrifice	28		normal
H-76	Terminal sacrifice	28		normal
H-77	Terminal sacrifice	28		normal
H-78	Terminal sacrifice	28		normal
H-79	Terminal sacrifice	28		normal
H-80	Terminal sacrifice	28		normal

Appendix 10-1. Individual organ weights in male rats

INDIVIDUAL ORGAN WEIGHTS										
STUDY ID : GT13-00174			GROUP : Control					SEX : MALE		
	DOSE : 0 mg/m ³					UNIT : g				
ANIMAL ID :	C-1	C-2	C-3	C-4	C-5	C-6	C-7	C-8	C-9	C-10
BODY WEIGHTS	208.74	202.89	211.42	227.26	207.93	212.42	226.51	227.41	224.49	214.07
TESTIS (LEFT)	1.3782	1.3896	1.3330	1.4114	1.3651	1.3671	1.3639	1.4409	1.3894	1.3623
% BODY WEIGHTS	0.6602	0.6849	0.6305	0.6211	0.6565	0.6436	0.6021	0.6336	0.6189	0.6364
TESTIS (RIGHT)	1.3292	1.3253	1.2938	1.3808	1.3497	1.3573	1.4663	1.4389	1.3432	1.2992
% BODY WEIGHTS	0.6368	0.6532	0.6120	0.6076	0.6491	0.6390	0.6473	0.6327	0.5983	0.6069
KIDNEY (LEFT)	0.6797	0.7256	0.6999	0.7924	0.7043	0.7186	0.7760	0.7929	0.7755	0.7116
% BODY WEIGHTS	0.3256	0.3576	0.3310	0.3487	0.3387	0.3383	0.3426	0.3487	0.3454	0.3324
KIDNEY (RIGHT)	0.7402	0.7179	0.7342	0.7954	0.7236	0.7325	0.7991	0.7748	0.7687	0.7405
% BODY WEIGHTS	0.3546	0.3538	0.3473	0.3500	0.3480	0.3448	0.3528	0.3407	0.3424	0.3459
SPLEEN	0.5038	0.4454	0.5457	0.5930	0.5330	0.5032	0.6112	0.5470	0.6229	0.4959
% BODY WEIGHTS	0.2414	0.2195	0.2581	0.2609	0.2563	0.2369	0.2698	0.2405	0.2775	0.2317
LIVER	6.5479	6.0082	6.2816	6.9240	6.0856	6.2209	7.0010	6.6057	6.8865	6.2904
% BODY WEIGHTS	3.1369	2.9613	2.9711	3.0467	2.9268	2.9286	3.0908	2.9048	3.0676	2.9385
ADRENAL GLAND (LEFT)	0.0248	0.0241	0.0263	0.0286	0.0279	0.0247	0.0264	0.0230	0.0237	0.0249
% BODY WEIGHTS	0.0119	0.0119	0.0124	0.0126	0.0134	0.0116	0.0117	0.0101	0.0106	0.0116
ADRENAL GLAND(RIGHT)	0.0246	0.0242	0.0277	0.0258	0.0262	0.0221	0.0241	0.0235	0.0249	0.0229
% BODY WEIGHTS	0.0118	0.0119	0.0131	0.0114	0.0126	0.0104	0.0106	0.0103	0.0111	0.0107
HEART	0.7266	0.6919	0.8427	0.7653	0.7625	0.6475	0.8247	0.6851	0.7451	0.6551
% BODY WEIGHTS	0.3481	0.3410	0.3986	0.3368	0.3667	0.3048	0.3641	0.3013	0.3319	0.3060
THYMUS	0.2333	0.2170	0.2440	0.2510	0.1828	0.2118	0.2454	0.2043	0.2934	0.2077
% BODY WEIGHTS	0.1118	0.1070	0.1154	0.1104	0.0879	0.0997	0.1083	0.0898	0.1307	0.0970
LUNG (LEFT)	0.2910	0.3013	0.3099	0.3299	0.2773	0.3302	0.3504	0.3273	0.2944	0.3322
% BODY WEIGHTS	0.1394	0.1485	0.1466	0.1452	0.1334	0.1554	0.1547	0.1439	0.1311	0.1552
LUNG (RIGHT)	0.5393	0.5535	0.5848	0.5837	0.5289	0.5797	0.5956	0.5870	0.5891	0.5056
% BODY WEIGHTS	0.2584	0.2728	0.2766	0.2568	0.2544	0.2729	0.2629	0.2581	0.2624	0.2362
BRAIN	1.7704	1.7312	1.8033	1.8145	1.7899	1.9020	1.8334	1.8135	1.8689	1.7861
% BODY WEIGHTS	0.8481	0.8533	0.8529	0.7984	0.8608	0.8954	0.8094	0.7975	0.8325	0.8344
OLFACCTORY BULB	0.0586	0.0760	0.0980	0.0768	0.0779	0.0644	0.0719	0.0601	0.0829	0.0723
% BODY WEIGHTS	0.0281	0.0375	0.0464	0.0338	0.0375	0.0303	0.0317	0.0264	0.0369	0.0338
PITUITARY GLAND	0.0068	0.0070	0.0069	0.0087	0.0056	0.0063	0.0056	0.0046	0.0056	0.0062
% BODY WEIGHTS	0.0033	0.0035	0.0033	0.0038	0.0027	0.0030	0.0025	0.0020	0.0025	0.0029

Appendix 10-1. Individual organ weights in male rats (continued)

INDIVIDUAL ORGAN WEIGHTS										
STUDY ID : GT13-00174			GROUP : Low				SEX : MALE			
	DOSE : 0.2 mg/m ³									
ANIMAL ID :	L-11	L-12	L-13	L-14	L-15	L-16	L-17	L-18	L-19	L-20
BODY WEIGHTS	215.45	196.84	213.32	214.23	210.72	221.94	206.67	221.43	246.79	229.83
TESTIS (LEFT)	1.3582	1.3166	1.4301	1.4229	1.2612	1.4551	1.3501	1.3710	1.4355	1.4119
% BODY WEIGHTS	0.6304	0.6689	0.6704	0.6642	0.5985	0.6556	0.6533	0.6192	0.5817	0.6143
TESTIS (RIGHT)	1.3569	1.3039	1.4001	1.3425	1.2218	1.4222	1.3491	1.3384	1.5414	1.4667
% BODY WEIGHTS	0.6298	0.6624	0.6563	0.6267	0.5798	0.6408	0.6528	0.6044	0.6246	0.6382
KIDNEY (LEFT)	0.7444	0.6393	0.7439	0.7192	0.6934	0.7495	0.6963	0.7738	0.8568	0.8178
% BODY WEIGHTS	0.3455	0.3248	0.3487	0.3357	0.3291	0.3377	0.3369	0.3495	0.3472	0.3558
KIDNEY (RIGHT)	0.7077	0.6655	0.7373	0.7530	0.7305	0.7420	0.7291	0.7946	0.8810	0.8212
% BODY WEIGHTS	0.3285	0.3381	0.3456	0.3515	0.3467	0.3343	0.3528	0.3588	0.3570	0.3573
SPLEEN	0.5121	0.4609	0.5622	0.4951	0.4866	0.5178	0.4844	0.5343	0.6331	0.5788
% BODY WEIGHTS	0.2377	0.2341	0.2635	0.2311	0.2309	0.2333	0.2344	0.2413	0.2565	0.2518
LIVER	6.5809	5.8682	6.6429	6.3142	6.4917	6.5224	6.4066	6.5452	7.3834	6.4839
% BODY WEIGHTS	3.0545	2.9812	3.1141	2.9474	3.0807	2.9388	3.0999	2.9559	2.9918	2.8212
ADRENAL GLAND (LEFT)	0.0244	0.0244	0.0187	0.0297	0.0243	0.0260	0.0286	0.0292	0.0275	0.0255
% BODY WEIGHTS	0.0113	0.0124	0.0088	0.0139	0.0115	0.0117	0.0138	0.0132	0.0111	0.0111
ADRENAL GLAND(RIGHT)	0.0248	0.0233	0.0222	0.0255	0.0249	0.0253	0.0274	0.0255	0.0255	0.0244
% BODY WEIGHTS	0.0115	0.0118	0.0104	0.0119	0.0118	0.0114	0.0133	0.0115	0.0103	0.0106
HEART	0.6874	0.6099	0.6163	0.6838	0.6546	0.7644	0.7273	0.7894	0.8177	0.8077
% BODY WEIGHTS	0.3191	0.3098	0.2889	0.3192	0.3106	0.3444	0.3519	0.3565	0.3313	0.3514
THYMUS	0.2491	0.1936	0.2464	0.2100	0.2272	0.2080	0.2054	0.2496	0.2685	0.2124
% BODY WEIGHTS	0.1156	0.0984	0.1155	0.0980	0.1078	0.0937	0.0994	0.1127	0.1088	0.0924
LUNG (LEFT)	0.2853	0.2522	0.2891	0.2851	0.2759	0.3114	0.3434	0.2975	0.3624	0.3539
% BODY WEIGHTS	0.1324	0.1281	0.1355	0.1331	0.1309	0.1403	0.1662	0.1344	0.1468	0.1540
LUNG (RIGHT)	0.5226	0.4614	0.5327	0.5193	0.5184	0.5869	0.6241	0.5624	0.6499	0.6033
% BODY WEIGHTS	0.2426	0.2344	0.2497	0.2424	0.2460	0.2644	0.3020	0.2540	0.2633	0.2625
BRAIN	1.8104	1.8355	1.8300	1.8304	1.8038	1.8503	1.8590	1.8217	1.8651	1.8303
% BODY WEIGHTS	0.8403	0.9325	0.8579	0.8544	0.8560	0.8337	0.8995	0.8227	0.7557	0.7964
OLFACCTORY BULB	0.0664	0.0798	0.0822	0.0687	0.0856	0.0631	0.0627	0.0776	0.0789	0.0850
% BODY WEIGHTS	0.0308	0.0405	0.0385	0.0321	0.0406	0.0284	0.0303	0.0350	0.0320	0.0370
PITUITARY GLAND	0.0088	0.0070	0.0083	0.0061	0.0060	0.0054	0.0089	0.0081	0.0053	0.0098
% BODY WEIGHTS	0.0041	0.0036	0.0039	0.0028	0.0028	0.0024	0.0043	0.0037	0.0021	0.0043

Appendix 10-1. Individual organ weights in male rats (continued)

INDIVIDUAL ORGAN WEIGHTS										
STUDY ID : GT13-00174			GROUP : Medium				SEX : MALE			
	DOSE : 0.5 mg/m ³									UNIT : g
ANIMAL ID :	M-21	M-22	M-23	M-24	M-25	M-26	M-27	M-28	M-29	M-30
BODY WEIGHTS	195.54	204.91	219.39	209.00	198.90	224.26	230.41	230.95	210.02	206.29
TESTIS (LEFT)	1.2854	1.2870	1.3984	1.3957	1.3436	1.3324	1.3889	1.4234	1.3024	1.3159
% BODY WEIGHTS	0.6574	0.6281	0.6374	0.6678	0.6755	0.5941	0.6028	0.6163	0.6201	0.6379
TESTIS (RIGHT)	1.3259	1.2216	1.3539	1.3019	1.3062	1.3744	1.3688	1.3919	1.3548	1.3360
% BODY WEIGHTS	0.6781	0.5962	0.6171	0.6229	0.6567	0.6129	0.5941	0.6027	0.6451	0.6476
KIDNEY (LEFT)	0.6402	0.7067	0.7155	0.7823	0.6820	0.7211	0.7807	0.8089	0.7473	0.6916
% BODY WEIGHTS	0.3274	0.3449	0.3261	0.3743	0.3429	0.3215	0.3388	0.3502	0.3558	0.3353
KIDNEY (RIGHT)	0.6661	0.6714	0.7846	0.7616	0.7068	0.7249	0.7463	0.8165	0.7639	0.6873
% BODY WEIGHTS	0.3406	0.3277	0.3576	0.3644	0.3554	0.3232	0.3239	0.3535	0.3637	0.3332
SPLEEN	0.4859	0.4945	0.5482	0.5608	0.5133	0.6091	0.5708	0.6299	0.4890	0.4465
% BODY WEIGHTS	0.2485	0.2413	0.2499	0.2683	0.2581	0.2716	0.2477	0.2727	0.2328	0.2164
LIVER	5.6492	6.0861	6.7921	6.4747	6.1469	6.7667	7.0059	7.1433	5.9454	5.8300
% BODY WEIGHTS	2.8890	2.9701	3.0959	3.0979	3.0904	3.0173	3.0406	3.0930	2.8309	2.8261
ADRENAL GLAND (LEFT)	0.0274	0.0247	0.0263	0.0270	0.0278	0.0248	0.0229	0.0269	0.0219	0.0245
% BODY WEIGHTS	0.0140	0.0121	0.0120	0.0129	0.0140	0.0111	0.0099	0.0116	0.0104	0.0119
ADRENAL GLAND(RIGHT)	0.0258	0.0236	0.0332	0.0218	0.0257	0.0227	0.0214	0.0307	0.0196	0.0228
% BODY WEIGHTS	0.0132	0.0115	0.0151	0.0104	0.0129	0.0101	0.0093	0.0133	0.0093	0.0111
HEART	0.6115	0.6235	0.7085	0.6902	0.7512	0.7023	0.7406	0.7407	0.8021	0.6760
% BODY WEIGHTS	0.3127	0.3043	0.3229	0.3302	0.3777	0.3132	0.3214	0.3207	0.3819	0.3277
THYMUS	0.1605	0.1940	0.2380	0.2055	0.2059	0.2670	0.2216	0.2314	0.1914	0.1643
% BODY WEIGHTS	0.0821	0.0947	0.1085	0.0983	0.1035	0.1191	0.0962	0.1002	0.0911	0.0796
LUNG (LEFT)	0.2805	0.2784	0.3122	0.2936	0.3520	0.3209	0.3128	0.3178	0.3326	0.2732
% BODY WEIGHTS	0.1434	0.1359	0.1423	0.1405	0.1770	0.1431	0.1358	0.1376	0.1584	0.1324
LUNG (RIGHT)	0.5048	0.5631	0.5998	0.5610	0.6144	0.6047	0.6312	0.6637	0.6193	0.5296
% BODY WEIGHTS	0.2582	0.2748	0.2734	0.2684	0.3089	0.2696	0.2739	0.2874	0.2949	0.2567
BRAIN	1.7210	1.7270	1.7383	1.8085	1.8219	1.8604	1.8017	1.8533	1.7512	1.7464
% BODY WEIGHTS	0.8801	0.8428	0.7923	0.8653	0.9160	0.8296	0.7820	0.8025	0.8338	0.8466
OLFACCTORY BULB	0.0820	0.0726	0.0740	0.0813	0.0945	0.0592	0.0574	0.0855	0.0657	0.0719
% BODY WEIGHTS	0.0419	0.0354	0.0337	0.0389	0.0475	0.0264	0.0249	0.0370	0.0313	0.0349
PITUITARY GLAND	0.0087	0.0063	0.0124	0.0089	0.0088	0.0074	0.0090	0.0098	0.0072	0.0076
% BODY WEIGHTS	0.0044	0.0031	0.0057	0.0043	0.0044	0.0033	0.0039	0.0042	0.0034	0.0037

Appendix 10-1. Individual organ weights in male rats (continued)

INDIVIDUAL ORGAN WEIGHTS										
STUDY ID : GT13-00174			GROUP : High				SEX : MALE			
	DOSE : 1.0 mg/m ³					UNIT : g				
ANIMAL ID :	H-31	H-32	H-33	H-34	H-35	H-36	H-37	H-38	H-39	H-40
BODY WEIGHTS	207.59	211.02	197.02	214.87	208.86	212.60	205.39	227.38	225.42	236.36
TESTIS (LEFT)	1.3131	1.3686	1.3298	1.4325	1.3277	1.2854	1.3912	1.3899	1.3717	1.3622
% BODY WEIGHTS	0.6325	0.6486	0.6750	0.6667	0.6357	0.6046	0.6773	0.6113	0.6085	0.5763
TESTIS (RIGHT)	1.3163	1.3076	1.2529	1.3818	1.3318	1.2284	1.3666	1.3705	1.3553	1.3522
% BODY WEIGHTS	0.6341	0.6197	0.6359	0.6431	0.6377	0.5778	0.6654	0.6027	0.6012	0.5721
KIDNEY (LEFT)	0.7251	0.7170	0.6971	0.7254	0.7439	0.7035	0.6770	0.7318	0.7776	0.7640
% BODY WEIGHTS	0.3493	0.3398	0.3538	0.3376	0.3562	0.3309	0.3296	0.3218	0.3450	0.3232
KIDNEY (RIGHT)	0.7136	0.7656	0.6846	0.7396	0.7179	0.7006	0.6643	0.7616	0.8219	0.7953
% BODY WEIGHTS	0.3438	0.3628	0.3475	0.3442	0.3437	0.3295	0.3234	0.3349	0.3646	0.3365
SPLEEN	0.4894	0.5038	0.4767	0.5086	0.5042	0.5501	0.5597	0.5429	0.5505	0.5738
% BODY WEIGHTS	0.2358	0.2387	0.2420	0.2367	0.2414	0.2587	0.2725	0.2388	0.2442	0.2428
LIVER	6.1944	6.4613	6.1517	6.7980	6.2080	6.1349	5.9185	7.0039	6.4182	7.1390
% BODY WEIGHTS	2.9840	3.0619	3.1224	3.1638	2.9723	2.8857	2.8816	3.0803	2.8472	3.0204
ADRENAL GLAND (LEFT)	0.0253	0.0308	0.0257	0.0271	0.0286	0.0244	0.0229	0.0271	0.0233	0.0231
% BODY WEIGHTS	0.0122	0.0146	0.0130	0.0126	0.0137	0.0115	0.0111	0.0119	0.0103	0.0098
ADRENAL GLAND(RIGHT)	0.0291	0.0263	0.0239	0.0270	0.0288	0.0183	0.0217	0.0232	0.0214	0.0238
% BODY WEIGHTS	0.0140	0.0125	0.0121	0.0126	0.0138	0.0086	0.0106	0.0102	0.0095	0.0101
HEART	0.8019	0.7157	0.5952	0.6735	0.7133	0.7938	0.6722	0.7939	0.7556	0.7128
% BODY WEIGHTS	0.3863	0.3392	0.3021	0.3134	0.3415	0.3734	0.3273	0.3492	0.3352	0.3016
THYMUS	0.1996	0.2351	0.2170	0.1834	0.2161	0.2446	0.1889	0.2465	0.2265	0.2429
% BODY WEIGHTS	0.0962	0.1114	0.1101	0.0854	0.1035	0.1151	0.0920	0.1084	0.1005	0.1028
LUNG (LEFT)	0.2871	0.2977	0.2769	0.2800	0.2923	0.3224	0.2964	0.3503	0.3282	0.3057
% BODY WEIGHTS	0.1383	0.1411	0.1405	0.1303	0.1400	0.1516	0.1443	0.1541	0.1456	0.1293
LUNG (RIGHT)	0.5414	0.5450	0.5484	0.5652	0.5332	0.5798	0.5510	0.6312	0.5903	0.5624
% BODY WEIGHTS	0.2608	0.2583	0.2783	0.2630	0.2553	0.2727	0.2683	0.2776	0.2619	0.2379
BRAIN	1.7964	1.8286	1.8171	1.8046	1.7867	1.7700	1.7913	1.8217	1.8370	1.7736
% BODY WEIGHTS	0.8654	0.8666	0.9223	0.8399	0.8555	0.8325	0.8721	0.8012	0.8149	0.7504
OLFACCTORY BULB	0.0842	0.0821	0.0732	0.0716	0.0699	0.0462	0.0900	0.0872	0.0710	0.0702
% BODY WEIGHTS	0.0406	0.0389	0.0372	0.0333	0.0335	0.0217	0.0438	0.0383	0.0315	0.0297
PITUITARY GLAND	0.0074	0.0066	0.0064	0.0074	0.0060	0.0057	0.0053	0.0083	0.0057	0.0064
% BODY WEIGHTS	0.0036	0.0031	0.0032	0.0034	0.0029	0.0027	0.0026	0.0037	0.0025	0.0027

Appendix 10-2. Individual organ weights in female rats

INDIVIDUAL ORGAN WEIGHTS											
STUDY ID : GT13-00174		GROUP : Control							SEX :		
		DOSE : 0 mg/m ³							FEMALE		
ANIMAL ID :		C-41	C-42	C-43	C-44	C-45	C-46	C-47	C-48	UNIT : g	
BODY WEIGHTS		128.95	133.45	127.52	134.54	130.80	136.96	137.40	137.21	140.25	143.26
TESTIS (LEFT)		0.0300	0.0216	0.0186	0.0260	0.0200	0.0266	0.0165	0.0183	0.0269	0.0299
% BODY WEIGHTS		0.0233	0.0162	0.0146	0.0193	0.0153	0.0194	0.0120	0.0133	0.0192	0.0209
TESTIS (RIGHT)		0.0205	0.0222	0.0228	0.0244	0.0222	0.0274	0.0159	0.0236	0.0324	0.0359
% BODY WEIGHTS		0.0159	0.0166	0.0179	0.0181	0.0170	0.0200	0.0116	0.0172	0.0231	0.0251
KIDNEY (LEFT)		0.4292	0.4750	0.4398	0.4701	0.4850	0.5185	0.4593	0.4763	0.5156	0.5489
% BODY WEIGHTS		0.3328	0.3559	0.3449	0.3494	0.3708	0.3786	0.3343	0.3471	0.3676	0.3831
KIDNEY (RIGHT)		0.4683	0.4886	0.4604	0.4622	0.4925	0.5090	0.4320	0.4935	0.5285	0.5349
% BODY WEIGHTS		0.3632	0.3661	0.3610	0.3435	0.3765	0.3716	0.3144	0.3597	0.3768	0.3734
SPLEEN		0.3405	0.3069	0.2933	0.3793	0.3273	0.3537	0.2800	0.3584	0.3861	0.3685
% BODY WEIGHTS		0.2641	0.2300	0.2300	0.2819	0.2502	0.2583	0.2038	0.2612	0.2753	0.2572
LIVER		3.7327	3.7163	3.6692	3.7730	3.7519	4.0968	3.8544	3.7306	3.7252	3.7775
% BODY WEIGHTS		2.8947	2.7848	2.8774	2.8044	2.8684	2.9912	2.8052	2.7189	2.6561	2.6368
ADRENAL GLAND (LEFT)		0.0271	0.0242	0.0204	0.0259	0.0281	0.0309	0.0268	0.0283	0.0285	0.0267
% BODY WEIGHTS		0.0210	0.0181	0.0160	0.0193	0.0215	0.0226	0.0195	0.0206	0.0203	0.0186
ADRENAL GLAND(RIGHT)		0.0265	0.0204	0.0199	0.0228	0.0276	0.0274	0.0245	0.0274	0.0243	0.0256
% BODY WEIGHTS		0.0206	0.0153	0.0156	0.0169	0.0211	0.0200	0.0178	0.0200	0.0173	0.0179
HEART		0.5235	0.4339	0.4273	0.4695	0.4746	0.5726	0.4439	0.4961	0.4886	0.5349
% BODY WEIGHTS		0.4060	0.3251	0.3351	0.3490	0.3628	0.4181	0.3231	0.3616	0.3484	0.3734
THYMUS		0.1706	0.1537	0.1627	0.1513	0.1713	0.1658	0.1307	0.1800	0.1964	0.1951
% BODY WEIGHTS		0.1323	0.1152	0.1276	0.1125	0.1310	0.1211	0.0951	0.1312	0.1400	0.1362
LUNG (LEFT)		0.2182	0.2110	0.2156	0.2245	0.2195	0.2214	0.2122	0.2256	0.2335	0.2382
% BODY WEIGHTS		0.1692	0.1581	0.1691	0.1669	0.1678	0.1617	0.1544	0.1644	0.1665	0.1663
LUNG (RIGHT)		0.4006	0.4072	0.4018	0.4065	0.3619	0.4379	0.3826	0.4798	0.4189	0.4473
% BODY WEIGHTS		0.3107	0.3051	0.3151	0.3021	0.2767	0.3197	0.2785	0.3497	0.2987	0.3122
BRAIN		1.5881	1.7003	1.6698	1.6709	1.6296	1.7066	1.6366	1.7164	1.7003	1.7168
% BODY WEIGHTS		1.2316	1.2741	1.3094	1.2419	1.2459	1.2461	1.1911	1.2509	1.2123	1.1984
OLFACCTORY BULB		0.0772	0.0434	0.0837	0.0571	0.0566	0.0674	0.0675	0.0635	0.0727	0.0758
% BODY WEIGHTS		0.0599	0.0325	0.0656	0.0424	0.0433	0.0492	0.0491	0.0463	0.0518	0.0529
PITUITARY GLAND		0.0075	0.0047	0.0055	0.0059	0.0046	0.0111	0.0068	0.0066	0.0076	0.0072
% BODY WEIGHTS		0.0058	0.0035	0.0043	0.0044	0.0035	0.0081	0.0049	0.0048	0.0054	0.0050

Appendix 10-2. Individual organ weights in female rats (continued)

INDIVIDUAL ORGAN WEIGHTS										
STUDY ID : GT13-00174			GROUP : Low				SEX : FEMALE			
	DOSE : 0.2 mg/m ³									UNIT : g
ANIMAL ID :	L-51	L-52	L-53	L-54	L-55	L-56	L-57	L-58	L-59	L-60
BODY WEIGHTS	125.40	124.87	128.65	129.02	126.54	138.12	136.83	140.59	138.59	127.96
TESTIS (LEFT)	0.0229	0.0206	0.0189	0.0261	0.0232	0.0208	0.0278	0.0207	0.0269	0.0272
% BODY WEIGHTS	0.0183	0.0165	0.0147	0.0202	0.0183	0.0151	0.0203	0.0147	0.0194	0.0213
TESTIS (RIGHT)	0.0185	0.0210	0.0269	0.0228	0.0220	0.0236	0.0297	0.0287	0.0235	0.0185
% BODY WEIGHTS	0.0148	0.0168	0.0209	0.0177	0.0174	0.0171	0.0217	0.0204	0.0170	0.0145
KIDNEY (LEFT)	0.4251	0.4166	0.5200	0.4529	0.4476	0.4762	0.5143	0.5226	0.4828	0.4390
% BODY WEIGHTS	0.3390	0.3336	0.4042	0.3510	0.3537	0.3448	0.3759	0.3717	0.3484	0.3431
KIDNEY (RIGHT)	0.4641	0.4212	0.4987	0.4430	0.4530	0.4947	0.5107	0.5256	0.5158	0.4378
% BODY WEIGHTS	0.3701	0.3373	0.3876	0.3434	0.3580	0.3582	0.3732	0.3739	0.3722	0.3421
SPLEEN	0.3173	0.3206	0.3487	0.3148	0.3138	0.3182	0.3552	0.3671	0.3092	0.3121
% BODY WEIGHTS	0.2530	0.2567	0.2710	0.2440	0.2480	0.2304	0.2596	0.2611	0.2231	0.2439
LIVER	3.6356	3.4254	3.7655	3.4961	3.4294	3.7918	3.5918	3.8152	3.8773	3.8463
% BODY WEIGHTS	2.8992	2.7432	2.9269	2.7097	2.7101	2.7453	2.6250	2.7137	2.7977	3.0059
ADRENAL GLAND (LEFT)	0.0244	0.0278	0.0270	0.0214	0.0222	0.0282	0.0246	0.0319	0.0272	0.0259
% BODY WEIGHTS	0.0195	0.0223	0.0210	0.0166	0.0175	0.0204	0.0180	0.0227	0.0196	0.0202
ADRENAL GLAND(RIGHT)	0.0249	0.0227	0.0276	0.0248	0.0211	0.0262	0.0243	0.0263	0.0248	0.0239
% BODY WEIGHTS	0.0199	0.0182	0.0215	0.0192	0.0167	0.0190	0.0178	0.0187	0.0179	0.0187
HEART	0.4236	0.4308	0.4558	0.4571	0.4480	0.5062	0.5198	0.5300	0.4882	0.4443
% BODY WEIGHTS	0.3378	0.3450	0.3543	0.3543	0.3540	0.3665	0.3799	0.3770	0.3523	0.3472
THYMUS	0.1416	0.1462	0.1816	0.1538	0.1458	0.1719	0.1901	0.1864	0.158	0.1483
% BODY WEIGHTS	0.1129	0.1171	0.1412	0.1192	0.1152	0.1245	0.1389	0.1326	0.1140	0.1159
LUNG (LEFT)	0.2067	0.1893	0.2434	0.2183	0.2223	0.2131	0.2332	0.2490	0.2346	0.2001
% BODY WEIGHTS	0.1648	0.1516	0.1892	0.1692	0.1757	0.1543	0.1704	0.1771	0.1693	0.1564
LUNG (RIGHT)	0.3848	0.3325	0.3950	0.4454	0.4098	0.4185	0.4276	0.4048	0.4334	0.3985
% BODY WEIGHTS	0.3069	0.2663	0.3070	0.3452	0.3239	0.3030	0.3125	0.2879	0.3127	0.3114
BRAIN	1.6781	1.7030	1.7367	1.6587	1.6383	1.6711	1.6821	1.7157	1.6981	1.6459
% BODY WEIGHTS	1.3382	1.3638	1.3499	1.2856	1.2947	1.2099	1.2293	1.2204	1.2253	1.2863
OLFFACTORY BULB	0.0705	0.0682	0.0556	0.0702	0.0708	0.0809	0.0612	0.0731	0.0602	0.0815
% BODY WEIGHTS	0.0562	0.0546	0.0432	0.0544	0.0560	0.0586	0.0447	0.0520	0.0434	0.0637
PITUITARY GLAND	0.0057	0.0054	0.0059	0.0054	0.0050	0.0079	0.0078	0.0071	0.0077	0.0047
% BODY WEIGHTS	0.0045	0.0043	0.0046	0.0042	0.0040	0.0057	0.0057	0.0051	0.0056	0.0037

Appendix 10-2. Individual organ weights in female rats (continued)

INDIVIDUAL ORGAN WEIGHTS										
STUDY ID : GT13-00174			GROUP : Medium					SEX :		
			DOSE : 0.5 mg/m ³					FEMALE		
ANIMAL ID :	M-61	M-62	M-63	M-64	M-65	M-66	M-67	M-68	M-69	M-70
BODY WEIGHTS	125.99	129.48	136.12	131.52	138.16	123.32	142.26	142.20	139.15	149.56
TESTIS (LEFT)	0.0247	0.0278	0.0206	0.0263	0.0217	0.0238	0.0232	0.0220	0.0250	0.0320
% BODY WEIGHTS	0.0196	0.0215	0.0151	0.0200	0.0157	0.0193	0.0163	0.0155	0.0180	0.0214
TESTIS (RIGHT)	0.0205	0.0230	0.0259	0.0237	0.0228	0.0215	0.0239	0.0288	0.0251	0.0373
% BODY WEIGHTS	0.0163	0.0178	0.0190	0.0180	0.0165	0.0174	0.0168	0.0203	0.0180	0.0249
KIDNEY (LEFT)	0.4936	0.4659	0.4767	0.4678	0.4655	0.4215	0.5030	0.5057	0.5438	0.5211
% BODY WEIGHTS	0.3918	0.3598	0.3502	0.3557	0.3369	0.3418	0.3536	0.3556	0.3908	0.3484
KIDNEY (RIGHT)	0.4573	0.4607	0.4767	0.4811	0.4822	0.4707	0.5181	0.5168	0.5137	0.5319
% BODY WEIGHTS	0.3630	0.3558	0.3502	0.3658	0.3490	0.3817	0.3642	0.3634	0.3692	0.3556
SPLEEN	0.3391	0.3007	0.3145	0.3386	0.3253	0.3248	0.3593	0.3400	0.3602	0.3554
% BODY WEIGHTS	0.2691	0.2322	0.2310	0.2575	0.2355	0.2634	0.2526	0.2391	0.2589	0.2376
LIVER	3.7319	3.7786	3.6470	3.8444	3.7670	3.5608	3.9434	3.8840	3.9684	4.2246
% BODY WEIGHTS	2.9621	2.9183	2.6793	2.9231	2.7265	2.8874	2.7720	2.7314	2.8519	2.8247
ADRENAL GLAND (LEFT)	0.0264	0.0249	0.0263	0.0260	0.0293	0.0248	0.0257	0.0267	0.0273	0.0303
% BODY WEIGHTS	0.0210	0.0192	0.0193	0.0198	0.0212	0.0201	0.0181	0.0188	0.0196	0.0203
ADRENAL GLAND(RIGHT)	0.0254	0.0264	0.0234	0.0227	0.0265	0.0251	0.0270	0.0232	0.0250	0.0271
% BODY WEIGHTS	0.0202	0.0204	0.0172	0.0173	0.0192	0.0204	0.0190	0.0163	0.0180	0.0181
HEART	0.4494	0.4620	0.4888	0.4564	0.4738	0.4520	0.4909	0.4668	0.4820	0.5586
% BODY WEIGHTS	0.3567	0.3568	0.3591	0.3470	0.3429	0.3665	0.3451	0.3283	0.3464	0.3735
THYMUS	0.1445	0.1420	0.1516	0.1707	0.1655	0.1377	0.1727	0.1432	0.1832	0.1757
% BODY WEIGHTS	0.1147	0.1097	0.1114	0.1298	0.1198	0.1117	0.1214	0.1007	0.1317	0.1175
LUNG (LEFT)	0.2072	0.2128	0.2277	0.2306	0.2341	0.2371	0.2264	0.2173	0.2383	0.2587
% BODY WEIGHTS	0.1645	0.1643	0.1673	0.1753	0.1694	0.1923	0.1591	0.1528	0.1713	0.1730
LUNG (RIGHT)	0.4093	0.3992	0.4148	0.3849	0.4118	0.4426	0.4251	0.4271	0.4217	0.4363
% BODY WEIGHTS	0.3249	0.3083	0.3047	0.2927	0.2981	0.3589	0.2988	0.3004	0.3031	0.2917
BRAIN	1.6174	1.6783	1.6752	1.6385	1.6170	1.7096	1.6688	1.7292	1.6780	1.7312
% BODY WEIGHTS	1.2838	1.2962	1.2307	1.2458	1.1704	1.3863	1.1731	1.2160	1.2059	1.1575
OLFFACTORY BULB	0.0709	0.0694	0.0708	0.0647	0.0677	0.0761	0.0736	0.0756	0.0785	0.0767
% BODY WEIGHTS	0.0563	0.0536	0.0520	0.0492	0.0490	0.0617	0.0517	0.0532	0.0564	0.0513
PITUITARY GLAND	0.0060	0.0053	0.0055	0.0073	0.0102	0.0087	0.0060	0.0059	0.0078	0.0079
% BODY WEIGHTS	0.0048	0.0041	0.0040	0.0056	0.0074	0.0071	0.0042	0.0041	0.0056	0.0053

Appendix 10-2. Individual organ weights in female rats (continued)

INDIVIDUAL ORGAN WEIGHTS										
STUDY ID : GT13-00174			GROUP : High					SEX :		
			DOSE : 1.0 mg/m ³					FEMALE		
ANIMAL ID :	H-71	H-72	H-73	H-74	H-75	H-76	H-77	H-78	H-79	H-80
BODY WEIGHTS	133.58	132.85	128.24	128.57	144.01	134.24	142.12	143.25	129.83	124.48
TESTIS (LEFT)	0.0261	0.0202	0.0193	0.0157	0.0260	0.0241	0.0225	0.0323	0.0234	0.0261
% BODY WEIGHTS	0.0195	0.0152	0.0150	0.0122	0.0181	0.0180	0.0158	0.0225	0.0180	0.0210
TESTIS (RIGHT)	0.0331	0.0210	0.0235	0.0153	0.0305	0.0238	0.0227	0.0254	0.0275	0.0248
% BODY WEIGHTS	0.0248	0.0158	0.0183	0.0119	0.0212	0.0177	0.0160	0.0177	0.0212	0.0199
KIDNEY (LEFT)	0.5090	0.4869	0.4910	0.4589	0.5431	0.5169	0.4966	0.5099	0.4910	0.4553
% BODY WEIGHTS	0.3810	0.3665	0.3829	0.3569	0.3771	0.3851	0.3494	0.3560	0.3782	0.3658
KIDNEY (RIGHT)	0.5159	0.4623	0.4788	0.4604	0.5216	0.5309	0.5034	0.5115	0.5049	0.5027
% BODY WEIGHTS	0.3862	0.3480	0.3734	0.3581	0.3622	0.3955	0.3542	0.3571	0.3889	0.4038
SPLEEN	0.3843	0.2771	0.3121	0.2903	0.3958	0.3756	0.3503	0.3577	0.3218	0.3074
% BODY WEIGHTS	0.2877	0.2086	0.2434	0.2258	0.2748	0.2798	0.2465	0.2497	0.2479	0.2469
LIVER	4.0147	3.8309	3.9284	3.6055	4.2593	3.8589	3.9500	3.9997	3.3916	3.4670
% BODY WEIGHTS	3.0055	2.8836	3.0633	2.8043	2.9576	2.8746	2.7793	2.7921	2.6123	2.7852
ADRENAL GLAND (LEFT)	0.0274	0.0283	0.0268	0.0242	0.0335	0.0238	0.0260	0.0253	0.0239	0.0247
% BODY WEIGHTS	0.0205	0.0213	0.0209	0.0188	0.0233	0.0177	0.0183	0.0177	0.0184	0.0198
ADRENAL GLAND(RIGHT)	0.0281	0.0261	-	0.0242	0.0289	0.0255	0.0238	0.0261	0.0244	0.0203
% BODY WEIGHTS	0.0210	0.0196	-	0.0188	0.0201	0.0190	0.0167	0.0182	0.0188	0.0163
HEART	0.4687	0.4225	0.4483	0.4442	0.6384	0.5683	0.4896	0.5589	0.4784	0.4902
% BODY WEIGHTS	0.3509	0.3180	0.3496	0.3455	0.4433	0.4233	0.3445	0.3902	0.3685	0.3938
THYMUS	0.1791	0.1669	0.1484	0.1453	0.2026	0.1878	0.1635	0.1729	0.1537	0.1632
% BODY WEIGHTS	0.1341	0.1256	0.1157	0.1130	0.1407	0.1399	0.1150	0.1207	0.1184	0.1311
LUNG (LEFT)	0.2151	0.2219	0.2307	0.2112	0.2530	0.2197	0.2351	0.2718	0.2025	0.2249
% BODY WEIGHTS	0.1610	0.1670	0.1799	0.1643	0.1757	0.1637	0.1654	0.1897	0.1560	0.1807
LUNG (RIGHT)	0.4227	0.3974	0.3946	0.3782	0.4745	0.4341	0.4150	0.4928	0.4100	0.3874
% BODY WEIGHTS	0.3164	0.2991	0.3077	0.2942	0.3295	0.3234	0.2920	0.3440	0.3158	0.3112
BRAIN	1.6734	1.6786	1.6717	1.6407	1.7219	1.6962	1.6770	1.7399	1.6715	1.6252
% BODY WEIGHTS	1.2527	1.2635	1.3036	1.2761	1.1957	1.2636	1.1800	1.2146	1.2875	1.3056
OLFACCTORY BULB	0.0667	0.0830	0.0647	0.0684	0.0712	0.0504	0.0791	0.0779	0.0802	0.0716
% BODY WEIGHTS	0.0499	0.0625	0.0505	0.0532	0.0494	0.0375	0.0557	0.0544	0.0618	0.0575
PITUITARY GLAND	0.0087	0.0061	0.0059	0.0051	0.0068	0.0089	0.0070	0.0081	0.0060	0.0102
% BODY WEIGHTS	0.0065	0.0046	0.0046	0.0040	0.0047	0.0066	0.0049	0.0057	0.0046	0.0082

Appendix 11-1. Individual biochemistry test in male rats

INDIVIDUAL BIOCHEMISTRY TEST												
STUDY : GT13-00174				GROUP : Control					SEX : MALE			
ANIMAL	ALB ¹	ALP ²	CA ³	CHO ⁴	CRE ⁵	GGT ⁶	GLU ⁷	GOT ⁸	GPT ⁹	IP ¹⁰	LDH ¹¹	MG ¹²
ID	g/dL	IU/L	mg/dL	mg/dL	mg/dL	IU/L	mg/dL	mg/dL	IU/L	mg/dL	IU/L	mg/dL
C-1	2.8	772	14.3	60	0.51	0	148	128	47	6.5	1475	2.3
C-2	2.7	709	13.9	53	0.5	0	150	148	68	7.6	1086	2.2
C-3	2.8	820	14.1	64	0.7	0	166	102	49	8.1	649	2.4
C-4	2.7	722	14.3	57	0.53	0	155	101	42	7	825	2.1
C-5	2.8	740	14.2	55	0.56	0	165	111	42	7.4	1123	2
C-6	2.7	788	14.6	47	0.58	0	189	92	44	7.7	218	2
C-7	2.8	730	14.8	55	0.8	0	188	81	43	7.9	180	2.2
C-8	2.7	723	14.2	59	0.54	0	137	105	46	6.9	812	2
C-9	2.8	756	14.4	58	0.57	0	171	96	45	7.1	663	2.2
C-10	2.7	629	14.6	53	0.5	0	161	92	49	6.5	235	1.8
N	10	10	10	10	10	10	10	10	10	10	10	10
ANIMAL	TP ¹³	UA ¹⁴	BUN ¹⁵	TBIL ¹⁶	TG ¹⁷	CK ¹⁸	Na ¹⁹	K ²⁰	Cl ²¹	A/G ²²		
ID	g/dL	mg/dL	mg/dL	mg/dL	mg/dL	IU/L	mmol/L	mmol/L	mmol/L			
C-1	5.9	1.5	22.1	0.02	60	291	159	4.7	116	0.90		
C-2	5.8	1	24.7	0.05	51	326	147	4.2	107	0.87		
C-3	6.1	1.6	23.4	0.02	79	267	146	4.5	106	0.85		
C-4	6	1.2	21.7	0.03	89	546	146	4.3	107	0.82		
C-5	5.9	1.4	22.5	0.01	78	847	146	4.5	107	0.90		
C-6	5.8	1.6	23.3	0.02	44	293	146	4.2	109	0.87		
C-7	6.2	1.9	22.4	0.02	53	310	146	4.2	106	0.82		
C-8	5.9	1.9	21.9	0.03	50	644	146	4.7	108	0.84		
C-9	6.1	1.2	23.2	0	77	529	146	4.2	107	0.85		
C-10	5.8	1.2	21.1	0.05	88	244	147	4.4	109	0.87		
N	10	10	10	10	10	10	10	10	10	10		

1, Albumin; 2, Alkaline phosphatase; 3, Calcium; 4, Cholesterol; 5, Creatinine; 6, Gamma glutamyl transpeptidase; 7, Glucose; 8, Glutamic oxalacetic transaminase; 9, Glutamic pyruvic transaminase; 10, Inorganic phosphorus; 11, Lactate Dehydrogenase; 12, Magnesium; 13, Total protein; 14, Uric acid; 15, Blood urea nitrogen; 16, Total bilirubin; 17, Triglyceride; 18, Creatine Kinase; 19, Sodium; 20, Potassium; 21, Chloride; 22, ratio of albumin and globulin

Appendix 11-1. Individual biochemistry test in male rats (continued)

INDIVIDUAL BIOCHEMISTRY TEST												
STUDY : GT13-00174				GROUP : Low					SEX : MALE			
ANIMAL	ALB ¹	ALP ²	CA ³	CHO ⁴	CRE ⁵	GGT ⁶	GLU ⁷	GOT ⁸	GPT ⁹	IP ¹⁰	LDH ¹¹	MG ¹²
ID	g/dL	IU/L	mg/dL	mg/dL	mg/dL	IU/L	mg/dL	mg/dL	IU/L	mg/dL	IU/L	mg/dL
L-11	2.8	773	14	66	0.6	0	142	140	50	6.8	1713	2.2
L-12	2.7	715	14.2	58	0.57	1	160	98	49	5.9	615	2.2
L-13	2.7	802	14.8	58	0.49	0	183	81	38	8	175	2.1
L-14	2.8	709	14.3	70	0.57	0	143	114	50	7.1	1143	2.1
L-15	2.7	643	14.7	60	0.46	0	169	117	47	7.5	949	2.2
L-16	2.6	756	15	49	0.63	0	179	88	45	8.3	274	2.1
L-17	2.8	666	14.6	57	0.73	3	202	155	52	6.9	175	2.2
L-18	2.8	736	13.8	58	0.61	0	143	107	48	6.7	766	2.2
L-19	2.7	645	14.4	70	0.54	3	135	96	38	7.4	752	2.1
L-20	2.6	763	14.6	47	0.15	4	160	84	41	6.9	146	2.1
N	10	10	10	10	10	10	10	10	10	10	10	10
ANIMAL	TP ¹³	UA ¹⁴	BUN ¹⁵	TBIL ¹⁶	TG ¹⁷	CK ¹⁸	Na ¹⁹	K ²⁰	Cl ²¹	A/G ²²		
ID	g/dL	mg/dL	mg/dL	mg/dL	mg/dL	IU/L	mmol/L	mmol/L	mmol/L			
L-11	6.1	1.5	24.5	0	44	413	147	4.2	107	0.85		
L-12	5.9	1.8	21.1	0.12	58	168	146	4.7	110	0.84		
L-13	5.9	1.4	21.7	0.03	68	162	146	4	109	0.84		
L-14	6	1.1	21.1	0.12	89	561	147	4.2	106	0.88		
L-15	6	1.1	25.6	0.09	94	708	146	4.3	107	0.82		
L-16	5.7	1.2	22.7	0.04	45	480	147	4.3	108	0.84		
L-17	6.5	1.5	24	0.07	61	210	147	4.1	108	0.76		
L-18	6.3	1.3	21.8	0	56	652	145	4.4	107	0.80		
L-19	6.1	1.1	17.9	0	66	515	148	4.3	108	0.79		
L-20	5.8	1	18	0.06	29	347	147	4.1	110	0.81		
N	10	10	10	10	10	10	10	10	10	10		

1, Albumin; 2, Alkaline phosphatase; 3, Calcium; 4, Cholesterol; 5, Creatinine; 6, Gamma glutamyl transpeptidase; 7, Glucose; 8, Glutamic oxalacetic transaminase; 9, Glutamic pyruvic transaminase; 10, Inorganic phosphorus; 11, Lactate Dehydrogenase; 12, Magnesium; 13, Total protein; 14, Uric acid; 15, Blood urea nitrogen; 16, Total bilirubin; 17, Triglyceride; 18, Creatine Kinase; 19, Sodium; 20, Potassium; 21, Chloride; 22, ratio of albumin and globulin

Appendix 11-1. Individual biochemistry test in male rats (continued)

INDIVIDUAL BIOCHEMISTRY TEST												
STUDY : GT13-00174				GROUP : Medium					SEX : MALE			
ANIMAL	ALB ¹	ALP ²	CA ³	CHO ⁴	CRE ⁵	GGT ⁶	GLU ⁷	GOT ⁸	GPT ⁹	IP ¹⁰	LDH ¹¹	MG ¹²
ID	g/dL	IU/L	mg/dL	mg/dL	mg/dL	IU/L	mg/dL	mg/dL	IU/L	mg/dL	IU/L	mg/dL
M-21	2.7	740	13.1	53	0.76	0	138	134	46	6.5	1724	2.4
M-22	2.7	766	13.7	59	0.53	0	143	123	49	6.9	1225	2.3
M-23	2.7	715	15.1	51	0.22	2	194	83	41	7.8	135	2
M-24	2.7	740	14.2	56	0.54	5	151	110	38	7.2	1159	2.2
M-25	2.8	753	14.6	55	0.73	1	158	104	42	7.5	767	2.2
M-26	2.7	836	15.2	51	0.93	0	146	103	52	10.2	410	2.7
M-27	2.8	783	14.7	60	0.71	1	131	159	52	9.8	1417	2.5
M-28	2.7	753	14	52	0.58	0	131	150	60	8.5	1732	2.2
M-29	2.8	687	13.4	43	0.34	0	129	126	66	6.4	638	2.2
M-30	2.8	667	14.2	54	1.08	0	133	133	76	7.8	339	2.2
N	10	10	10	10	10	10	10	10	10	10	10	10
ANIMAL	TP ¹³	UA ¹⁴	BUN ¹⁵	TBIL ¹⁶	TG ¹⁷	CK ¹⁸	Na ¹⁹	K ²⁰	Cl ²¹	A/G ²²		
ID	g/dL	mg/dL	mg/dL	mg/dL	mg/dL	IU/L	mmol/L	mmol/L	mmol/L			
M-21	5.9	1.7	21.1	0	24	431	147	4.6	109	0.84		
M-22	5.9	0.9	21.1	0.03	43	307	148	4.2	109	0.84		
M-23	5.9	1	20.1	0	74	130	144	4.2	108	0.84		
M-24	6.2	1.4	21.1	0	71	638	147	4.5	107	0.77		
M-25	6.2	1.3	22.6	0	54	453	145	4.5	106	0.82		
M-26	6	2.1	23	0.13	32	566	147	4.8	104	0.82		
M-27	6.1	1.7	25.4	0.06	50	1521	148	4.5	104	0.85		
M-28	5.7	0.5	24	0.43	58	1144	145	4.7	104	0.90		
M-29	5.9	0.6	21.3	0.47	13	460	148	4.5	110	0.90		
M-30	5.7	0.7	22.2	0.55	27	347	148	4.4	109	0.97		
N	10	10	10	10	10	10	10	10	10	10		

1, Albumin; 2, Alkaline phosphatase; 3, Calcium; 4, Cholesterol; 5, Creatinine; 6, Gamma glutamyl transpeptidase; 7, Glucose; 8, Glutamic oxalacetic transaminase; 9, Glutamic pyruvic transaminase; 10, Inorganic phosphorus; 11, Lactate Dehydrogenase; 12, Magnesium; 13, Total protein; 14, Uric acid; 15, Blood urea nitrogen; 16, Total bilirubin; 17, Triglyceride; 18, Creatine Kinase; 19, Sodium; 20, Potassium; 21, Chloride; 22, ratio of albumin and globulin

Appendix 11-1. Individual biochemistry test in male rats (continued)

INDIVIDUAL BIOCHEMISTRY TEST												
STUDY : GT13-00174				GROUP : High					SEX : MALE			
ANIMAL	ALB ¹	ALP ²	CA ³	CHO ⁴	CRE ⁵	GGT ⁶	GLU ⁷	GOT ⁸	GPT ⁹	IP ¹⁰	LDH ¹¹	MG ¹²
ID	g/dL	IU/L	mg/dL	mg/dL	mg/dL	IU/L	mg/dL	mg/dL	IU/L	mg/dL	IU/L	mg/dL
H-31	2.7	722	14.1	59	0.29	0	129	134	67	8.5	1173	2.5
H-32	2.7	797	14.2	61	0.94	1	148	88	36	6.3	1046	2.3
E-33	2.8	707	14.7	58	0.57	0	132	116	48	6.3	1040	2.4
H-34	2.7	787	13.7	69	0.87	5	162	137	41	6.7	1870	2.3
H-35	2.8	711	14.3	54	0.76	0	166	93	47	7.3	413	2.2
H-36	2.7	637	14.6	57	0.89	0	138	120	56	9.8	676	2.7
H-37	2.8	653	14.6	58	0.23	0	99	27	35	9	1412	2.6
H-38	2.7	664	15.1	64	0.64	0	142	134	59	9.4	1067	2.6
H-39	2.7	669	15.2	53	1.01	0	144	85	43	7.1	461	2.1
H-40	2.7	740	15.7	47	0.54	0	154	87	32	8.1	551	2.2
N	10	10	10	10	10	10	10	10	10	10	10	10
ANIMAL	TP ¹³	UA ¹⁴	BUN ¹⁵	TBIL ¹⁶	TG ¹⁷	CK ¹⁸	Na ¹⁹	K ²⁰	Cl ²¹	A/G ²²		
ID	g/dL	mg/dL	mg/dL	mg/dL	mg/dL	IU/L	mmol/L	mmol/L	mmol/L			
H-31	6	1	28.2	0	35	657	148	4.5	110	0.82		
H-32	5.9	2.4	24	0	51	239	146	5.1	110	0.84		
E-33	6.2	2.5	23.3	0	71	584	147	5	109	0.82		
H-34	6.1	1.5	21	0	96	981	146	4.4	106	0.79		
H-35	6.1	1.1	22.8	0.07	86	333	147	4.6	109	0.85		
H-36	6	1.9	21.9	0.12	28	927	147	4.9	105	0.82		
H-37	6	1.7	28.2	0	48	1109	149	4.7	107	0.88		
H-38	6.1	2	27.8	0.03	68	1263	147	4.7	103	0.79		
H-39	6.1	1.4	21.7	0	35	279	147	4.5	107	0.79		
H-40	6.1	0.8	20	0	46	393	146	4.5	108	0.79		
N	10	10	10	10	10	10	10	10	10	10		

1, Albumin; 2, Alkaline phosphatase; 3, Calcium; 4, Cholesterol; 5, Creatinine; 6, Gamma glutamyl transpeptidase; 7, Glucose; 8, Glutamic oxalacetic transaminase; 9, Glutamic pyruvic transaminase; 10, Inorganic phosphorus; 11, Lactate Dehydrogenase; 12, Magnesium; 13, Total protein; 14, Uric acid; 15, Blood urea nitrogen; 16, Total bilirubin; 17, Triglyceride; 18, Creatine Kinase; 19, Sodium; 20, Potassium; 21, Chloride; 22, ratio of albumin and globulin

Appendix 11-2. Individual biochemistry test in female rats

INDIVIDUAL BIOCHEMISTRY TEST												
STUDY : GT13-00174				GROUP : Control					SEX : FEMALE			
ANIMAL	ALB ¹	ALP ²	CA ³	CHO ⁴	CRE ⁵	GGT ⁶	GLU ⁷	GOT ⁸	GPT ⁹	IP ¹⁰	LDH ¹¹	MG ¹²
ID	g/dL	IU/L	mg/dL	mg/dL	mg/dL	IU/L	mg/dL	mg/dL	IU/L	mg/dL	IU/L	mg/dL
C-41	2.8	648	13.5	64	0.78	0	113	145	56	8.3	1708	2.8
C-42	2.9	553	14.1	73	0.57	0	131	109	61	4.9	492	2.2
C-43	2.8	618	13.2	69	0.8	0	92	193	57	10	2494	2.6
C-44	2.5	488	13.8	56	0.66	2	144	89	29	6.1	601	2
C-45	2.8	562	14.1	52	0.41	5	130	77	24	5.5	392	2.2
C-46	2.7	457	13	61	0.17	9	166	144	56	5.8	571	2
C-47	2.8	537	13.2	72	0.41	0	150	108	54	7.5	340	2
C-48	2.6	508	13.2	60	0.73	0	123	120	63	5.5	430	2
C-49	2.5	522	12.8	62	0.4	3	151	74	32	6.1	294	2.1
C-50	2.7	451	13.8	80	0.76	10	158	96	38	7.6	254	2.1
N	10	10	10	10	10	10	10	10	10	10	10	10
ANIMAL	TP ¹³	UA ¹⁴	BUN ¹⁵	TBIL ¹⁶	TG ¹⁷	CK ¹⁸	Na ¹⁹	K ²⁰	Cl ²¹	A/G ²²		
ID	g/dL	mg/dL	mg/dL	mg/dL	mg/dL	IU/L	mmol/L	mmol/L	mmol/L			
C-41	6.2	2	26.4	0	11	942	150	4	107	0.82		
C-42	6.1	1.5	25.1	0.25	23	164	147	4.3	111	0.91		
C-43	6	1.9	31.2	0	14	1672	150	4.1	106	0.88		
C-44	5.6	1.5	23.7	0	19	398	146	4.4	110	0.81		
C-45	5.9	1.1	24	0	25	206	147	4	109	0.90		
C-46	5.7	1	24	0.37	13	319	144	3.9	107	0.90		
C-47	5.7	1.6	23.9	0	44	406	147	4	107	0.97		
C-48	5.5	1.5	23.8	0.15	17	333	146	4.1	108	0.90		
C-49	5.5	1.2	25.2	0.03	24	242	146	4.2	109	0.83		
C-50	6	1.6	26.3	0	12	452	147	4.1	108	0.82		
N	10	10	10	10	10	10	10	10	10	10		

1, Albumin; 2, Alkaline phosphatase; 3, Calcium; 4, Cholesterol; 5, Creatinine; 6, Gamma glutamyl transpeptidase; 7, Glucose; 8, Glutamic oxalacetic transaminase; 9, Glutamic pyruvic transaminase; 10, Inorganic phosphorus; 11, Lactate Dehydrogenase; 12, Magnesium; 13, Total protein; 14, Uric acid; 15, Blood urea nitrogen; 16, Total bilirubin; 17, Triglyceride; 18, Creatine Kinase; 19, Sodium; 20, Potassium; 21, Chloride; 22, ratio of albumin and globulin

Appendix 11-2. Individual biochemistry test in female rats (continued)

INDIVIDUAL BIOCHEMISTRY TEST												
STUDY : GT13-00174			GROUP : Low					SEX : FEMALE				
ANIMAL	ALB ¹	ALP ²	CA ³	CHO ⁴	CRE ⁵	GGT ⁶	GLU ⁷	GOT ⁸	GPT ⁹	IP ¹⁰	LDH ¹¹	MG ¹²
ID	g/dL	IU/L	mg/dL	mg/dL	mg/dL	IU/L	mg/dL	mg/dL	IU/L	mg/dL	IU/L	mg/dL
L-51	2.8	548	13.5	64	0.76	0	136	128	55	7.3	1088	2.3
L-52	2.9	562	14.1	84	0.83	0	127	123	57	7.5	454	2.2
L-53	2.7	476	13.5	54	0.56	0	99	155	48	5.3	1821	2.4
L-54	2.8	567	14.4	63	0.84	0	112	114	50	10.2	757	2.5
L-55	2.6	475	14.2	62	0.54	0	113	103	47	5.8	471	2.2
L-56	2.7	479	13	73	0.18	9	123	108	36	6.7	1071	2.1
L-57	2.6	506	13.1	73	0.6	7	137	80	27	6.3	388	2
L-58	2.8	445	13.4	64	0.63	0	113	102	45	5.4	674	2
L-59	2.8	455	12.7	62	0.58	0	85	129	51	4.1	1298	2.1
L-60	2.7	570	13.3	66	0.74	11	123	107	45	7.6	598	2.4
N	10	10	10	10	10	10	10	10	10	10	10	10
ANIMAL	TP ¹³	UA ¹⁴	BUN ¹⁵	TBIL ¹⁶	TG ¹⁷	CK ¹⁸	Na ¹⁹	K ²⁰	Cl ²¹	A/G ²²		
ID	g/dL	mg/dL	mg/dL	mg/dL	mg/dL	IU/L	mmol/L	mmol/L	mmol/L			
L-51	5.9	1.9	27	0	8	617	149	3.9	109	0.90		
L-52	6.3	2.2	26.1	0	17	346	148	4	108	0.85		
L-53	5.9	2.7	27.5	0	16	940	146	4.2	108	0.84		
L-54	6.1	1.9	26.3	0	18	672	149	4.3	107	0.85		
L-55	5.8	1	21.4	0.04	16	246	147	4.4	110	0.81		
L-56	6.2	1.7	26	0	28	665	147	4.1	108	0.77		
L-57	5.7	1.8	22.6	0	15	290	146	4.1	108	0.84		
L-58	6.1	1.2	23.3	0	21	450	145	4	108	0.85		
L-59	6.1	1.8	20.9	0	24	815	146	4.3	109	0.85		
L-60	6	1.9	24.8	0	29	504	148	4.2	108	0.82		
N	10	10	10	10	10	10	10	10	10	10		

1, Albumin; 2, Alkaline phosphatase; 3, Calcium; 4, Cholesterol; 5, Creatinine; 6, Gamma glutamyl transpeptidase; 7, Glucose; 8, Glutamic oxalacetic transaminase; 9, Glutamic pyruvic transaminase; 10, Inorganic phosphorus; 11, Lactate Dehydrogenase; 12, Magnesium; 13, Total protein; 14, Uric acid; 15, Blood urea nitrogen; 16, Total bilirubin; 17, Triglyceride; 18, Creatine Kinase; 19, Sodium; 20, Potassium; 21, Chloride; 22, ratio of albumin and globulin

Appendix 11-2. Individual biochemistry test in female rats (continued)

INDIVIDUAL BIOCHEMISTRY TEST												
STUDY : GT13-00174				GROUP : Medium					SEX : FEMALE			
ANIMAL	ALB ¹	ALP ²	CA ³	CHO ⁴	CRE ⁵	GGT ⁶	GLU ⁷	GOT ⁸	GPT ⁹	IP ¹⁰	LDH ¹¹	MG ¹²
ID	g/dL	IU/L	mg/dL	mg/dL	mg/dL	IU/L	mg/dL	mg/dL	IU/L	mg/dL	IU/L	mg/dL
M-61	2.6	592	13	64	0.59	0	124	123	57	6.7	966	2.3
M-62	2.8	540	13.6	78	0.65	0	147	120	52	6.7	811	2.3
M-63	2.9	562	13.9	76	0.62	0	95	184	42	8.5	2851	2.6
M-64	2.7	532	14.1	67	0.48	8	150	117	37	6.1	784	2.1
M-65	2.8	499	14.9	62	0.97	10	142	80	33	7.2	325	2.1
M-66	2.6	491	12.9	55	0.43	18	113	132	42	6.8	1418	2.2
M-67	2.9	465	14.1	74	0.61	0	140	103	42	4.6	548	2.1
M-68	2.7	562	13.2	58	0.62	0	110	100	48	6	495	2.1
M-69	2.6	465	13.4	66	0.38	0	124	122	44	6.9	967	2.2
M-70	2.7	468	13.6	46	0.69	0	151	103	44	6.4	811	2
N	10	10	10	10	10	10	10	10	10	10	10	10
ANIMAL	TP ¹³	UA ¹⁴	BUN ¹⁵	TBIL ¹⁶	TG ¹⁷	CK ¹⁸	Na ¹⁹	K ²⁰	Cl ²¹	A/G ²²		
ID	g/dL	mg/dL	mg/dL	mg/dL	mg/dL	IU/L	mmol/L	mmol/L	mmol/L			
M-61	5.5	1.1	24.8	0.14	16	441	147	4.1	109	0.90		
M-62	5.9	1.3	27.6	0	15	531	145	3.7	104	0.90		
M-63	6	1.8	29.3	0.09	16	1703	148	4.1	105	0.94		
M-64	5.9	1.9	24.8	0	22	1087	144	4.2	107	0.84		
M-65	6	1.8	21.8	0	34	340	146	4.2	109	0.88		
M-66	5.8	1.1	27.8	0	18	696	146	4.2	109	0.81		
M-67	6.3	1.3	24.7	0	24	305	146	4.3	110	0.85		
M-68	5.9	1.3	23.3	0.04	16	288	146	4.1	110	0.84		
M-69	5.8	1.1	23.8	0.04	12	707	146	4.2	108	0.81		
M-70	5.8	1.3	26.3	0	24	524	146	4	108	0.87		
N	10	10	10	10	10	10	10	10	10	10		

1, Albumin; 2, Alkaline phosphatase; 3, Calcium; 4, Cholesterol; 5, Creatinine; 6, Gamma glutamyl transpeptidase; 7, Glucose; 8, Glutamic oxalacetic transaminase; 9, Glutamic pyruvic transaminase; 10, Inorganic phosphorus; 11, Lactate Dehydrogenase; 12, Magnesium; 13, Total protein; 14, Uric acid; 15, Blood urea nitrogen; 16, Total bilirubin; 17, Triglyceride; 18, Creatine Kinase; 19, Sodium; 20, Potassium; 21, Chloride; 22, ratio of albumin and globulin

Appendix 11-2. Individual biochemistry test in female rats (continued)

INDIVIDUAL BIOCHEMISTRY TEST												
STUDY : GT13-00174				GROUP : High					SEX : FEMALE			
ANIMAL	ALB ¹	ALP ²	CA ³	CHO ⁴	CRE ⁵	GGT ⁶	GLU ⁷	GOT ⁸	GPT ⁹	IP ¹⁰	LDH ¹¹	MG ¹²
ID	g/dL	IU/L	mg/dL	mg/dL	mg/dL	IU/L	mg/dL	mg/dL	IU/L	mg/dL	IU/L	mg/dL
H-71	2.7	577	13	66	0.28	8	139	107	29	5.8	1023	2.3
H-72	2.8	598	13.8	73	0.7	0	155	128	51	7.1	802	2.2
H-73	2.7	529	13.3	62	0.7	0	102	179	56	6.3	2273	2.3
H-74	2.9	587	13.5	88	0.56	0	131	126	61	5.3	834	2.2
H-75	2.7	474	14.7	62	0.58	0	156	94	37	6	186	2.2
H-76	2.7	526	13	70	0.63	0	115	115	42	5.6	1090	2.2
H-77	2.9	516	13.1	73	0.64	0	128	104	42	4.3	817	2
H-78	2.6	457	13.2	66	0.53	0	97	99	43	5.3	629	2.1
H-79	2.7	519	13.3	66	0.58	0	131	115	44	5.1	865	2
H-80	2.8	424	13.4	68	0.52	0	109	124	47	5.3	512	2.2
N	10	10	10	10	10	10	10	10	10	10	10	10
ANIMAL	TP ¹³	UA ¹⁴	BUN ¹⁵	TBIL ¹⁶	TG ¹⁷	CK ¹⁸	Na ¹⁹	K ²⁰	Cl ²¹	A/G ²²		
ID	g/dL	mg/dL	mg/dL	mg/dL	mg/dL	IU/L	mmol/L	mmol/L	mmol/L			
H-71	5.8	1.2	22.2	0	23	444	147	4	110	0.87		
H-72	6	1.8	26.3	0	16	381	146	4.1	108	0.88		
H-73	5.8	1.9	26.6	0	21	1322	146	4.2	106	0.87		
H-74	6	1.5	23.7	0	33	342	147	4.1	108	0.94		
H-75	5.9	1	25.7	0.06	28	131	145	4	109	0.84		
H-76	5.9	1.3	25	0	25	597	146	3.9	108	0.84		
H-77	6.2	1.5	23.2	0	20	518	146	4.1	109	0.88		
H-78	5.8	1.2	21	0	26	346	145	4	109	0.81		
H-79	6	1.5	24.5	0	18	480	145	4.5	109	0.82		
H-80	6.3	1.5	21.8	0.01	11	617	145	4.6	109	0.80		
N	10	10	10	10	10	10	10	10	10	10		

1, Albumin; 2, Alkaline phosphatase; 3, Calcium; 4, Cholesterol; 5, Creatinine; 6, Gamma glutamyl transpeptidase; 7, Glucose; 8, Glutamic oxalacetic transaminase; 9, Glutamic pyruvic transaminase; 10, Inorganic phosphorus; 11, Lactate Dehydrogenase; 12, Magnesium; 13, Total protein; 14, Uric acid; 15, Blood urea nitrogen; 16, Total bilirubin; 17, Triglyceride; 18, Creatine Kinase; 19, Sodium; 20, Potassium; 21, Chloride; 22, ratio of albumin and globulin

Appendix 12-1. Individual hematological test in male rats

INDIVIDUAL HEMATOLOGICAL TEST												
STUDY : GT13-00174				GROUP : Control					SEX : MALE			
ANIMAL ID	WBC ¹ K/ μ L	NE ² K/ μ L	LY ³ K/ μ L	MO ⁴ K/ μ L	EO ⁵ K/ μ L	LUC ⁶ K/ μ L	BA ⁷ K/ μ L	NE ⁸ %	LY ⁹ %	MO ¹⁰ %	EO ¹¹ %	LUP ¹² %
C-1	4.52	1.47	2.95	0.05	0.03	0.01	0	32.6	65.3	1.1	0.7	0.3
C-2	2.83	0.84	1.91	0.04	0.03	0.01	0	29.6	67.4	1.4	1.1	0.5
C-3	3.79	0.88	2.79	0.07	0.04	0.02	0	23.2	73.5	1.8	1	0.5
C-4	3.17	0.8	2.27	0.05	0.03	0.02	0	25.2	71.6	1.6	1.1	0.5
C-5	3.21	0.9	2.22	0.04	0.04	0.01	0	28.1	69.1	1.2	1.3	0.3
C-6	3.06	0.74	2.19	0.05	0.05	0.01	0	24.2	71.7	1.8	1.8	0.4
C-7	4.11	0.99	2.96	0.09	0.04	0.02	0	24.1	72.2	2.1	1	0.6
C-8	3.01	1.22	1.36	0.34	0.07	0.01	0	40.6	45.2	11.4	2.3	0.4
C-9	2.31	0.41	1.5	0.09	0.27	0.03	0	17.9	65.2	4.1	11.5	1.3
C-10	2.92	1.29	0.9	0.34	0.35	0.04	0	44.1	30.8	11.6	12	1.4
N	10	10	10	10	10	10	10	10	10	10	10	10
ANIMAL ID	BA ¹³ %	RBC ¹⁴ M/ μ L	Hb ¹⁵ g/dL	HCT ¹⁶ %	MCV ¹⁷ fL	MCH ¹⁸ pg	MCHC ¹⁹ g/dL	RDW ²⁰ %	PLT ²¹ K/ μ L	MPV ²² fL	Reti ²³	
C-1	0	9.31	15.9	47.7	51.2	17.1	33.3	11.5	883	10.9	2.47	
C-2	0.1	9.53	15.9	48.4	50.8	16.7	32.8	11.3	820	10.9	2.03	
C-3	0	9.47	16	48.3	51	16.9	33.2	12.4	1020	9.8	3.23	
C-4	0	8.93	15.2	45.2	50.6	17	33.6	11.9	894	8.1	2.88	
C-5	0	9.38	16.1	49.6	52.9	17.1	32.4	12	725	10.6	2.68	
C-6	0.1	9.33	15.9	46.6	49.9	17.1	34.2	12.2	809	10.8	3.01	
C-7	0	8.87	15.3	45.4	51.1	17.3	33.8	11.9	890	8.4	3.24	
C-8	0.2	9.21	12.5	46.7	50.6	13.6	26.8	12.2	845	10.8	3.03	
C-9	0	8.89	15	46.1	51.8	16.9	32.6	11.8	887	10.6	2.97	
C-10	0	9.4	16.1	47.6	50.7	17.1	33.8	12.5	847	10.6	2.98	
N	10	10	10	10	10	10	10	10	10	10	10	

1, White blood cell; 2, Neutrophils; 3, Lymphocyte; 4, Monocyte; 5, Eosinophil; 6, Large unstain cells; 7, Basophil; 8, Percent of neutrophils; 9, Percent of lymphocyte; 10, Percent of monocyte; 11, Percent of eosinophil; 12, Large unstain cells percent; 13, Percent of basophil; 14, Red blood cell; 15, Hemoglobin; 16, Hematocrit; 17, Mean corpuscular volume; 18, Mean corpuscular hemoglobin; 19, Mean corpuscular hemoglobin concentration; 20, Red cell distribution width; 21, Platelet; 22, Mean platelet volume; 23, Reticulocyte

Appendix 12-1. Individual hematological test in male rats (continued)

INDIVIDUAL HEMATOLOGICAL TEST												
STUDY : GT13-00174				GROUP : Low					SEX : MALE			
ANIMAL ID	WBC ¹ K/ μ L	NE ² K/ μ L	LY ³ K/ μ L	MO ⁴ K/ μ L	EO ⁵ K/ μ L	LUC ⁶ K/ μ L	BA ⁷ K/ μ L	NE ⁸ %	LY ⁹ %	MO ¹⁰ %	EO ¹¹ %	LUP ¹² %
	K/ μ L	K/ μ L	K/ μ L	K/ μ L	K/ μ L	K/ μ L	K/ μ L	%	%	%	%	%
L-11	4.29	1.46	2.71	0.05	0.05	0.03	0	34.1	63	1.2	1.1	0.6
L-12	2.56	0.78	1.73	0.02	0.02	0.01	0	30.4	67.4	0.9	0.9	0.3
L-13	5.18	1.32	3.72	0.08	0.04	0.02	0	25.6	71.8	1.6	0.7	0.3
L-14	3.24	0.69	2.44	0.05	0.04	0.03	0	21.2	75.2	1.4	1.3	0.9
L-15	2.5	0.76	1.67	0.04	0.03	0	0	30.4	66.7	1.4	1.3	0.2
L-16	2.86	0.9	1.77	0.05	0.11	0.01	0	31.6	61.9	1.8	4	0.5
L-17	4.06	1.04	2.9	0.05	0.06	0.02	0	25.6	71.3	1.3	1.4	0.5
L-18	3.16	1.15	1.9	0.05	0.06	0	0	36.3	60.1	1.4	2	0.1
L-19	3.61	1.1	1.9	0.09	0.42	0.09	0	30.5	52.6	2.5	11.7	2.6
L-20	2.38	1.07	0.83	0.17	0.21	0.1	0	44.8	34.9	7	9	4.1
N	10	10	10	10	10	10	10	10	10	10	10	10
ANIMAL ID	BA ¹³ %	RBC ¹⁴ M/ μ L	Hb ¹⁵ g/dL	HCT ¹⁶ %	MCV ¹⁷ fL	MCH ¹⁸ pg	MCHC ¹⁹ g/dL	RDW ²⁰ %	PLT ²¹ K/ μ L	MPV ²² fL	Reti ²³	
	%	M/ μ L	g/dL	%	fL	pg	g/dL	%	K/ μ L	fL		
L-11	0	9.19	15.8	46.8	50.9	17.2	33.7	11.6	873	8.6	2.46	
L-12	0.1	9.24	15.4	46.6	50.4	16.7	33.1	11.7	876	10.3	2.54	
L-13	0	8.86	15	45.4	51.3	16.9	33	12.1	890	8.1	2.97	
L-14	0	9.05	15.7	46	50.8	17.4	34.1	11.6	716	11.4	2.51	
L-15	0	9.16	15.6	46.8	51	17	33.3	11.5	851	11	2.56	
L-16	0.2	9.14	15.6	46.4	50.8	17.1	33.7	12	689	9.1	2.72	
L-17	0	9.39	16	48.3	51.4	17.1	33.2	12	761	7.5	2.47	
L-18	0	8.9	15.5	45.8	51.4	17.4	33.8	11.8	909	11.2	3.18	
L-19	0	9.14	15.4	47.4	51.9	16.8	32.4	11.8	879	11.4	2.71	
L-20	0.1	9.37	15.8	47.9	51.2	16.8	32.9	11.8	901	9.9	2.75	
N	10	10	10	10	10	10	10	10	10	10	10	

1, White blood cell; 2, Neutrophils; 3, Lymphocyte; 4, Monocyte; 5, Eosinophil; 6, Large unstain cells; 7, Basophil; 8, Percent of neutrophils; 9, Percent of lymphocyte; 10, Percent of monocyte; 11, Percent of eosinophil; 12, Large unstain cells percent; 13, Percent of basophil; 14, Red blood cell; 15, Hemoglobin; 16, Hematocrit; 17, Mean corpuscular volume; 18, Mean corpuscular hemoglobin; 19, Mean corpuscular hemoglobin concentration; 20, Red cell distribution width; 21, Platelet; 22, Mean platelet volume; 23, Reticulocyte

Appendix 12-1. Individual hematological test in male rats (continued)

INDIVIDUAL HEMATOLOGICAL TEST												
STUDY : GT13-00174				GROUP : Medium					SEX : MALE			
ANIMAL ID	WBC ¹ K/ μ L	NE ² K/ μ L	LY ³ K/ μ L	MO ⁴ K/ μ L	EO ⁵ K/ μ L	LUC ⁶ K/ μ L	BA ⁷ K/ μ L	NE ⁸ %	LY ⁹ %	MO ¹⁰ %	EO ¹¹ %	LUP ¹² %
								%	%	%	%	%
M-21	2.32	1.11	1.14	0.03	0.03	0.01	0	47.8	49	1.4	1.4	0.3
M-22	2.81	0.71	2.04	0.03	0.03	0.01	0	25.1	72.7	1	0.9	0.3
M-23	3.73	1.02	2.57	0.06	0.05	0.02	0	27.5	68.9	1.7	1.2	0.7
M-24	3.71	0.86	2.74	0.05	0.03	0.03	0	23.2	74	1.2	0.8	0.8
M-25	3.6	0.68	2.79	0.05	0.05	0.02	0	19	77.5	1.5	1.4	0.6
M-26	2.48	0.66	1.73	0.04	0.02	0.01	0	26.7	70	1.7	1	0.6
M-27	3.74	0.15	3.42	0.02	0.14	0.01	0	3.9	91.4	0.5	3.8	0.2
M-28	3.3	0.85	2.31	0.07	0.03	0.03	0	25.9	70.1	2	0.9	1
M-29	2.15	0.78	1.3	0.04	0.02	0.01	0	36.1	60.5	2	1.1	0.3
M-30	1.81	0.55	1.02	0.1	0.13	0.02	0	30.3	56.2	5.4	7.1	1.1
N	10	10	10	10	10	10	10	10	10	10	10	10
ANIMAL ID	BA ¹³ %	RBC ¹⁴ M/ μ L	Hb ¹⁵ g/dL	HCT ¹⁶ %	MCV ¹⁷ fL	MCH ¹⁸ pg	MCHC ¹⁹ g/dL	RDW ²⁰ %	PLT ²¹ K/ μ L	MPV ²² fL	Reti ²³	
								%	K/ μ L	fL		
M-21	0.2	9.23	15.5	47.2	51.1	16.8	32.9	11.7	759	10.9	2.81	
M-22	0	9.24	15.9	47.9	51.8	17.2	33.1	11.8	863	11.2	2.83	
M-23	0	9.22	15.5	46.8	50.8	16.8	33.1	12	840	8.1	2.39	
M-24	0.1	9.34	16	47.8	51.1	17.1	33.5	12.1	834	11.8	2.86	
M-25	0	9.48	15.8	47.6	50.2	16.7	33.2	12	840	10.7	2.76	
M-26	0.1	9.04	15.3	47.7	52.8	17	32.1	12.5	894	12.3	3.73	
M-27	0.1	9.17	15.2	48.3	52.7	16.6	31.5	11.9	939	11.5	3.15	
M-28	0.1	9.14	15.7	47	51.4	17.2	33.4	12.7	880	9.1	3.68	
M-29	0	9.4	16	47.7	50.7	17	33.6	12.3	808	11.4	3	
M-30	0	9.62	16.4	49.2	51.1	17.1	33.3	11.5	758	11	2.19	
N	10	10	10	10	10	10	10	10	10	10	10	

1, White blood cell; 2, Neutrophils; 3, Lymphocyte; 4, Monocyte; 5, Eosinophil; 6, Large unstain cells; 7, Basophil; 8, Percent of neutrophils; 9, Percent of lymphocyte; 10, Percent of monocyte; 11, Percent of eosinophil; 12, Large unstain cells percent; 13, Percent of basophil; 14, Red blood cell; 15, Hemoglobin; 16, Hematocrit; 17, Mean corpuscular volume; 18, Mean corpuscular hemoglobin; 19, Mean corpuscular hemoglobin concentration; 20, Red cell distribution width; 21, Platelet; 22, Mean platelet volume; 23, Reticulocyte

Appendix 12-1. Individual hematological test in male rats (continued)

INDIVIDUAL HEMATOLOGICAL TEST												
STUDY : GT13-00174				GROUP : High					SEX : MALE			
ANIMAL ID	WBC ¹	NE ²	LY ³	MO ⁴	EO ⁵	LUC ⁶	BA ⁷	NE ⁸	LY ⁹	MO ¹⁰	EO ¹¹	LUP ¹²
	K/ μ L	K/ μ L	K/ μ L	K/ μ L	K/ μ L	K/ μ L	K/ μ L	%	%	%	%	%
H-31	1.99	0.7	1.22	0.03	0.03	0.01	0	35.1	61.5	1.5	1.5	0.4
H-32	2.53	0.92	1.54	0.04	0.03	0.01	0	36.4	60.7	1.5	1.1	0.3
H-33	4.3	1.12	3.03	0.06	0.08	0.02	0	26	70.4	1.4	1.9	0.4
H-34	4.83	1.07	3.61	0.08	0.05	0.02	0	22.2	74.8	1.6	1.1	0.3
H-35	3.84	1.3	2.37	0.1	0.04	0.02	0	34	61.9	2.5	1	0.5
H-36	3.56	0.7	2.69	0.07	0.05	0.04	0	19.7	75.7	2	1.3	1.2
H-37	2.43	0.64	1.59	0.08	0.08	0.04	0	26.2	65.3	3.1	3.5	1.7
H-38	3.59	1.31	1.63	0.16	0.32	0.17	0	36.6	45.4	4.5	8.9	4.7
H-39	2.74	0.67	1.72	0.16	0.16	0.04	0	24.4	62.6	5.7	5.9	1.3
H-40	2.55	1.01	1.13	0.12	0.27	0.03	0	39.4	44.3	4.5	10.5	1.2
N	10	10	10	10	10	10	10	10	10	10	10	10
ANIMAL ID	BA ¹³	RBC ¹⁴	Hb ¹⁵	HCT ¹⁶	MCV ¹⁷	MCH ¹⁸	MCHC ¹⁹	RDW ²⁰	PLT ²¹	MPV ²²	Reti ²³	
	%	M/ μ L	g/dL	%	fL	pg	g/dL	%	K/ μ L	fL		
H-31	0	8.97	15.5	46.8	52.2	17.3	33.1	12.1	921	10.9	2.52	
H-32	0	9.22	15.4	46.1	50	16.8	33.5	11.9	894	10.2	2.72	
H-33	0	8.82	15.3	44.4	50.4	17.3	34.4	11.7	405	8.2	2.77	
H-34	0	9.28	15.8	47.5	51.2	17	33.2	11.5	828	11.9	2.43	
H-35	0.1	9.53	16	48	50.4	16.8	33.3	11.8	787	10.8	2.52	
H-36	0.1	9.61	16	49.4	51.4	16.6	32.3	11.8	882	9	2.86	
H-37	0.2	9.55	16.2	49.8	52.1	16.9	32.5	11.9	538	11.4	3.04	
H-38	0	9.3	15.9	49.9	53.6	17.1	32	12	870	11.7	3.23	
H-39	0	9.52	16.1	48.1	50.5	16.9	33.6	11.6	789	10.1	2.34	
H-40	0	9.24	15.7	47.5	51.4	17	33	11.7	852	10.7	2.92	
N	10	10	10	10	10	10	10	10	10	10	10	

1, White blood cell; 2, Neutrophils; 3, Lymphocyte; 4, Monocyte; 5, Eosinophil; 6, Large unstain cells; 7, Basophil; 8, Percent of neutrophils; 9, Percent of lymphocyte; 10, Percent of monocyte; 11, Percent of eosinophil; 12, Large unstain cells percent; 13, Percent of basophil; 14, Red blood cell; 15, Hemoglobin; 16, Hematocrit; 17, Mean corpuscular volume; 18, Mean corpuscular hemoglobin; 19, Mean corpuscular hemoglobin concentration; 20, Red cell distribution width; 21, Platelet; 22, Mean platelet volume; 23, Reticulocyte

Appendix 12-2. Individual hematological test in female rats

INDIVIDUAL HEMATOLOGICAL TEST												
STUDY : GT13-00174				GROUP : Control					SEX : FEMALE			
ANIMAL ID	WBC ¹ K/ μ L	NE ² K/ μ L	LY ³ K/ μ L	MO ⁴ K/ μ L	EO ⁵ K/ μ L	LUC ⁶ K/ μ L	BA ⁷ K/ μ L	NE ⁸ %	LY ⁹ %	MO ¹⁰ %	EO ¹¹ %	LUP ¹² %
	C-41	2.65	0.62	1.95	0.04	0.04	0	0	23.4	73.6	1.4	1.5
C-42	3.4	0.77	2.48	0.05	0.1	0.01	0	22.7	72.8	1.3	3	0.2
C-43	4	1.19	2.62	0.07	0.07	0.07	0	29.6	65.4	1.8	1.6	1.6
C-44	2.75	0.65	1.99	0.06	0.04	0.01	0	23.6	72.3	2	1.6	0.5
C-45	3.08	0.88	2.1	0.04	0.05	0	0	28.5	68.2	1.3	1.7	0.1
C-46	3	1.02	1.88	0.04	0.05	0.01	0	34	62.7	1.3	1.6	0.3
C-47	3.32	1.09	2.08	0.09	0.05	0.01	0	32.8	62.7	2.7	1.4	0.4
C-48	2.28	0.82	1.36	0.04	0.06	0.01	0	35.7	59.4	1.9	2.5	0.3
C-49	1.69	0.49	1.14	0.02	0.03	0.01	0	29	67.5	1.5	1.7	0.4
C-50	2.36	0.57	1.71	0.03	0.04	0.01	0	24.3	72.3	1.3	1.7	0.3
N	10	10	10	10	10	10	10	10	10	10	10	10
ANIMAL ID	BA ¹³ %	RBC ¹⁴ M/ μ L	Hb ¹⁵ g/dL	HCT ¹⁶ %	MCV ¹⁷ fL	MCH ¹⁸ pg	MCHC ¹⁹ g/dL	RDW ²⁰ %	PLT ²¹ K/ μ L	MPV ²² fL	Reti ²³	
	C-41	0	8.91	15.5	47	52.7	17.4	33	11.6	663	10	2.52
C-42	0	9.2	16.3	49.5	53.8	17.7	32.9	11.8	727	10.1	2.03	
C-43	0	9.29	16.4	52.4	56.4	17.6	31.3	12.2	699	10.5	2.35	
C-44	0	8.97	15.9	46.8	52.1	17.7	34	11.7	823	11.5	2.64	
C-45	0.1	9.02	15.7	47.9	53.1	17.5	32.9	12.1	600	10.9	3.34	
C-46	0	9.09	15.9	46.6	51.3	17.5	34.2	11.8	882	11.2	2.57	
C-47	0	9.57	17.2	49.9	52.2	18	34.5	11.9	826	10.7	2.66	
C-48	0.2	8.8	15.8	46	52.3	18	34.4	11.1	780	10	1.79	
C-49	0	9.1	16	48.2	53	17.6	33.3	11.6	859	11	2.79	
C-50	0.1	9.32	16.3	49.4	53	17.5	33	11.3	919	9.8	2.28	
N	10	10	10	10	10	10	10	10	10	10	10	

1, White blood cell; 2, Neutrophils; 3, Lymphocyte; 4, Monocyte; 5, Eosinophil; 6, Large unstain cells; 7, Basophil; 8, Percent of neutrophils; 9, Percent of lymphocyte; 10, Percent of monocyte; 11, Percent of eosinophil; 12, Large unstain cells percent; 13, Percent of basophil; 14, Red blood cell; 15, Hemoglobin; 16, Hematocrit; 17, Mean corpuscular volume; 18, Mean corpuscular hemoglobin; 19, Mean corpuscular hemoglobin concentration; 20, Red cell distribution width; 21, Platelet; 22, Mean platelet volume; 23, Reticulocyte

Appendix 12-2. Individual hematological test in female rats (continued)

INDIVIDUAL HEMATOLOGICAL TEST												
STUDY : GT13-00174				GROUP : Low					SEX : FEMALE			
ANIMAL ID	WBC ¹	NE ²	LY ³	MO ⁴	EO ⁵	LUC ⁶	BA ⁷	NE ⁸	LY ⁹	MO ¹⁰	EO ¹¹	LUP ¹²
	K/ μ L	K/ μ L	K/ μ L	K/ μ L	K/ μ L	K/ μ L	K/ μ L	%	%	%	%	%
L-51	2.02	0.55	1.32	0.03	0.12	0	0	27.3	65.2	1.4	5.9	0.1
L-52	2.65	1.08	1.47	0.03	0.06	0.01	0	40.7	55.4	1.1	2.4	0.3
L-53	2.57	0.54	1.93	0.02	0.07	0	0	21.1	75.2	0.9	2.7	0.2
L-54	3.65	0.77	2.75	0.06	0.05	0.02	0	21	75.3	1.6	1.4	0.7
L-55	2.96	0.83	2.01	0.05	0.05	0.01	0	28.1	67.9	1.8	1.8	0.3
L-56	2.7	0.8	1.76	0.08	0.04	0.01	0	29.8	65.4	2.8	1.4	0.4
L-57	2.68	0.53	2.09	0.03	0.02	0.01	0	19.9	77.9	1.1	0.9	0.3
L-58	2.77	0.7	1.97	0.04	0.05	0.01	0	25.3	71	1.5	1.9	0.3
L-59	1.99	0.73	1.19	0.02	0.04	0.01	0	36.9	59.7	0.9	2.1	0.4
L-60	3.37	1.14	2.11	0.08	0.04	0.01	0	33.7	62.6	2.2	1.1	0.3
N	10	10	10	10	10	10	10	10	10	10	10	10
ANIMAL ID	BA ¹³	RBC ¹⁴	Hb ¹⁵	HCT ¹⁶	MCV ¹⁷	MCH ¹⁸	MCHC ¹⁹	RDW ²⁰	PLT ²¹	MPV ²²	Reti ²³	
	%	M/ μ L	g/dL	%	fL	pg	g/dL	%	K/ μ L	fL		
L-51	0.1	8.86	16	50.2	56.7	18	31.8	12.1	702	10.1	2.48	
L-52	0.1	9.46	16.7	51.8	54.8	17.7	32.2	12.3	669	10	2.5	
L-53	0	8.96	15.8	48.6	54.2	17.7	32.6	11.7	774	10	2.13	
L-54	0.1	9.38	16.6	50.6	54	17.7	32.8	11.9	826	11.2	2.33	
L-55	0.1	9.23	16.3	48	52	17.7	34	11.7	934	11.4	2.22	
L-56	0.1	9.36	16.6	48.7	52.1	17.7	34.1	11.3	873	11.2	2.14	
L-57	0	9.03	16	47.2	52.2	17.7	33.9	11.1	825	11.3	1.88	
L-58	0	9.02	15.9	47.1	52.3	17.6	33.7	11.4	922	11.3	2.44	
L-59	0.1	9.08	16	46.6	51.3	17.6	34.3	11.5	836	7.7	2.13	
L-60	0.1	9.06	16.2	48.6	53.6	17.9	33.3	11.6	811	10.2	2.59	
N	10	10	10	10	10	10	10	10	10	10	10	

1, White blood cell; 2, Neutrophils; 3, Lymphocyte; 4, Monocyte; 5, Eosinophil; 6, Large unstain cells; 7, Basophil; 8, Percent of neutrophils; 9, Percent of lymphocyte; 10, Percent of monocyte; 11, Percent of eosinophil; 12, Large unstain cells percent; 13, Percent of basophil; 14, Red blood cell; 15, Hemoglobin; 16, Hematocrit; 17, Mean corpuscular volume; 18, Mean corpuscular hemoglobin; 19, Mean corpuscular hemoglobin concentration; 20, Red cell distribution width; 21, Platelet; 22, Mean platelet volume; 23, Reticulocyte

Appendix 12-2. Individual hematological test in female rats (continued)

INDIVIDUAL HEMATOLOGICAL TEST												
STUDY : GT13-00174				GROUP : Medium					SEX : FEMALE			
ANIMAL ID	WBC ¹ K/ μ L	NE ² K/ μ L	LY ³ K/ μ L	MO ⁴ K/ μ L	EO ⁵ K/ μ L	LUC ⁶ K/ μ L	BA ⁷ K/ μ L	NE ⁸ %	LY ⁹ %	MO ¹⁰ %	EO ¹¹ %	LUP ¹² %
								%	%	%	%	%
M-61	1.83	0.19	1.37	0.08	0.16	0.04	0	10.5	74.7	4.1	8.6	2.1
M-62	3.34	0.86	2.28	0.06	0.11	0.02	0	25.9	68.4	1.8	3.2	0.6
M-63	4.39	1.04	3.18	0.08	0.08	0.01	0	23.8	72.4	1.9	1.7	0.3
M-64	3.32	1.11	2.07	0.07	0.05	0.02	0	33.5	62.3	2.2	1.4	0.6
M-65	2.4	0.71	1.6	0.05	0.03	0.01	0	29.4	66.5	2.1	1.3	0.5
M-66	2.03	0.6	1.35	0.04	0.04	0.01	0	29.7	66.2	1.7	2.1	0.2
M-67	2.98	1.05	1.79	0.05	0.07	0.02	0	35.2	60	1.7	2.5	0.7
M-68	1.71	0.67	0.95	0.03	0.05	0	0	39	55.7	2	3.1	0.1
M-69	2.6	0.5	2.03	0.02	0.04	0.01	0	19.4	77.9	0.7	1.7	0.3
M-70	2.48	0.44	1.96	0.03	0.03	0.01	0	17.6	79.2	1.4	1.4	0.3
N	10	10	10	10	10	10	10	10	10	10	10	10
ANIMAL ID	BA ¹³ %	RBC ¹⁴ M/ μ L	Hb ¹⁵ g/dL	HCT ¹⁶ %	MCV ¹⁷ fL	MCH ¹⁸ pg	MCHC ¹⁹ g/dL	RDW ²⁰ %	PLT ²¹ K/ μ L	MPV ²² fL	Reti ²³	
								%	K/ μ L	fL		
M-61	0	9.06	15.7	47.2	52.1	17.3	33.2	12	752	8.5	2.45	
M-62	0	8.83	15.6	47	53.2	17.6	33.1	12.1	750	10	2.09	
M-63	0	9.35	16.8	51.2	54.7	18	32.9	12	710	10.3	2.3	
M-64	0	9.6	16.8	49.8	51.9	17.5	33.7	11.8	760	10.8	2.48	
M-65	0.1	9.55	17	50.5	52.8	17.8	33.7	11.6	790	11.1	2.68	
M-66	0	8.9	15.7	46.3	52	17.6	33.9	11.2	824	11.4	1.56	
M-67	0	9.12	16.5	47.5	52.1	18	34.6	11.4	783	10.8	2.29	
M-68	0.1	8.98	16.1	48	53.4	17.9	33.5	11.7	720	11.3	2.57	
M-69	0.1	8.98	15.9	47.8	53.3	17.7	33.2	11.3	897	10.9	2.32	
M-70	0.1	9.14	16.2	47.8	52.4	17.7	33.8	11.6	868	9.8	2.09	
N	10	10	10	10	10	10	10	10	10	10	10	

1, White blood cell; 2, Neutrophils; 3, Lymphocyte; 4, Monocyte; 5, Eosinophil; 6, Large unstain cells; 7, Basophil; 8, Percent of neutrophils; 9, Percent of lymphocyte; 10, Percent of monocyte; 11, Percent of eosinophil; 12, Large unstain cells percent; 13, Percent of basophil; 14, Red blood cell; 15, Hemoglobin; 16, Hematocrit; 17, Mean corpuscular volume; 18, Mean corpuscular hemoglobin; 19, Mean corpuscular hemoglobin concentration; 20, Red cell distribution width; 21, Platelet; 22, Mean platelet volume; 23, Reticulocyte

Appendix 12-2. Individual hematological test in female rats (continued)

INDIVIDUAL HEMATOLOGICAL TEST												
STUDY : GT13-00174				GROUP : High					SEX : FEMALE			
ANIMAL ID	WBC ¹ K/ μ L	NE ² K/ μ L	LY ³ K/ μ L	MO ⁴ K/ μ L	EO ⁵ K/ μ L	LUC ⁶ K/ μ L	BA ⁷ K/ μ L	NE ⁸ %	LY ⁹ %	MO ¹⁰ %	EO ¹¹ %	LUP ¹² %
								%	%	%	%	%
H-71	2.5	0.92	1.46	0.04	0.07	0.01	0	36.8	58.3	1.6	3	0.2
H-72	2.42	0.91	1.38	0.04	0.08	0.01	0	37.7	57.2	1.6	3.2	0.3
H-73	2.75	0.68	1.89	0.04	0.13	0.01	0.01	24.7	68.6	1.5	4.8	0.2
H-74	3.8	1.13	2.52	0.06	0.07	0.02	0	29.8	66.4	1.6	1.8	0.4
H-75	3.7	0.9	2.65	0.06	0.07	0.02	0	24.3	71.5	1.7	1.9	0.6
H-76	2.88	0.83	1.91	0.06	0.06	0.01	0	29	66.2	2.2	2.1	0.4
H-77	2.81	0.97	1.74	0.04	0.05	0	0	34.7	61.9	1.4	1.9	0.2
H-78	2.67	0.86	1.7	0.06	0.05	0	0	32.3	63.6	2.2	1.8	0.1
H-79	3.29	1.04	2.14	0.04	0.05	0.01	0	31.8	65.1	1.3	1.5	0.2
H-80	1.88	0.54	1.27	0.03	0.03	0	0	29	67.8	1.7	1.4	0.1
N	10	10	10	10	10	10	10	10	10	10	10	10
ANIMAL ID	BA ¹³ %	RBC ¹⁴ M/ μ L	Hb ¹⁵ g/dL	HCT ¹⁶ %	MCV ¹⁷ fL	MCH ¹⁸ pg	MCHC ¹⁹ g/dL	RDW ²⁰ %	PLT ²¹ K/ μ L	MPV ²² fL	Reti ²³	
								%	K/ μ L	fL		
H-71	0.1	9.03	15.9	49.6	54.9	17.6	32.1	12	604	10.1	2.4	
H-72	0	8.99	16	50	55.6	17.7	31.9	11.9	573	9.5	2.36	
H-73	0.2	8.69	15.3	47.7	55	17.7	32.1	11.8	745	9.9	2.19	
H-74	0.1	9.34	16.5	48.6	52	17.6	33.9	11.9	725	10.9	2.12	
H-75	0.1	9.22	16.4	48.4	52.5	17.8	33.9	11.4	935	11.2	2.22	
H-76	0	9	16.2	48.6	54	18	33.4	11.6	899	11.5	2.67	
H-77	0	9.11	16.3	47.4	52	17.9	34.4	11.3	804	10.5	2.02	
H-78	0	8.88	15.8	47.4	53.4	17.8	33.3	11.7	891	11.2	2.51	
H-79	0	8.92	15.9	46	51.6	17.8	34.4	11.2	802	5.9	2.05	
H-80	0	9.31	16.5	48	51.5	17.7	34.4	11.6	966	10.2	2.22	
N	10	10	10	10	10	10	10	10	10	10	10	

1, White blood cell; 2, Neutrophils; 3, Lymphocyte; 4, Monocyte; 5, Eosinophil; 6, Large unstain cells; 7, Basophil; 8, Percent of neutrophils; 9, Percent of lymphocyte; 10, Percent of monocyte; 11, Percent of eosinophil; 12, Large unstain cells percent; 13, Percent of basophil; 14, Red blood cell; 15, Hemoglobin; 16, Hematocrit; 17, Mean corpuscular volume; 18, Mean corpuscular hemoglobin; 19, Mean corpuscular hemoglobin concentration; 20, Red cell distribution width; 21, Platelet; 22, Mean platelet volume; 23, Reticulocyte

Appendix 13-1. Individual Blood coagulation test in male rats

INDIVIDUAL BLOOD COAGULATION TEST

STUDY ID : GT13-00174 GROUP : Control SEX : MALE
DOSE : 0 mg/m³

ANIMAL	APTT (sec)	PT (sec)
C-1	24.1	8.25
C-2	22.0	8.55
C-3	19.2	8.25
C-4	20.3	8.85
C-5	20.4	8.1
C-6	19.4	8.85
C-7	20	8.55
C-8	20.1	9
C-9	20	8.85
C-10	19.2	8.7

STUDY ID : GT13-00174 GROUP : Low SEX : MALE
DOSE : 0.2 mg/m³

ANIMAL	APTT (sec)	PT (sec)
L-11	20.5	8.10
L-12	21.1	8.4
L-13	20.5	8.7
L-14	20.7	8.85
L-15	20.4	8.25
L-16	19.8	8.85
L-17	20.3	8.55
L-18	19.6	8.25
L-19	20.4	8.70
L-20	21	9

APTT : activated partial thromboplastin time, PT : prothrombin time

Appendix 13-1. Individual Blood coagulation test in male rats (continued)

INDIVIDUAL BLOOD COAGULATION TEST

STUDY ID : GT13-00174 GROUP : Medium SEX : MALE
 DOSE : 0.5 mg/m³

ANIMAL	APTT (sec)	PT (sec)
M-21	21.6	8.1
M-22	21.1	8.25
M-23	21.0	8.55
M-24	20.3	8.85
M-25	20.1	8.7
M-26	20.4	8.7
M-27	21.1	8.1
M-28	18.8	8.55
M-29	20.7	9
M-30	21.3	9

STUDY ID : GT13-00174 GROUP : High SEX : MALE
 DOSE : 1.0 mg/m³

ANIMAL	APTT (sec)	PT (sec)
H-31	22.4	7.95
H-32	21.5	8.25
H-33	18.9	8.40
H-34	18.1	8.40
H-35	21.8	8.85
H-36	22.6	8.85
H-37	23.1	9.00
H-38	20.7	8.4
H-39	20	8.85
H-40	18.3	8.4

APTT : activated partial thromboplastin time, PT : prothrombin time

Appendix 13-2. Individual Blood coagulation test in female rats

INDIVIDUAL BLOOD COAGULATION TEST

STUDY ID : GT13-00174 GROUP : Control SEX : FEMALE
DOSE : 0 mg/m³

ANIMAL	APTT (sec)	PT (sec)
C-41	22.5	8.7
C-42	22.4	9.15
C-43	22.5	8.25
C-44	24	9.75
C-45	23.5	9.75
C-46	23	8.55
C-47	21.9	8.7
C-48	22.5	9.75
C-49	33.0	14.40
C-50	23	9.30

STUDY ID : GT13-00174 GROUP : Low SEX : FEMALE
DOSE : 0.2 mg/m³

ANIMAL	APTT (sec)	PT (sec)
L-51	23.9	8.70
L-52	22.4	8.4
L-53	22.4	8.70
L-54	22.6	9.45
L-55	27	10.6
L-56	24.1	9.15
L-57	23.4	9.6
L-58	21.1	8.7
L-59	26.7	9.90
L-60	19.4	8.85

APTT : activated partial thromboplastin time, PT : prothrombin time

Appendix 13-2. Individual Blood coagulation test in female rats (continued)

INDIVIDUAL BLOOD COAGULATION TEST

STUDY ID : GT13-00174 GROUP : Medium SEX : FEMALE
 DOSE : 0.5 mg/m³

ANIMAL	APTT (sec)	PT (sec)
M-61	26.3	9.75
M-62	25.6	8.85
M-63	29.5	9.30
M-64	21.5	8.85
M-65	28.6	10.8
M-66	27.8	10.20
M-67	26.5	9.9
M-68	25.5	10.20
M-69	27.1	10.10
M-70	24.9	9.90

STUDY ID : GT13-00174 GROUP : High SEX : FEMALE
 DOSE : 1.0 mg/m³

ANIMAL	APTT (sec)	PT (sec)
H-71	25.4	8.70
H-72	20.1	8.7
H-73	25.4	9.00
H-74	24.3	9.60
H-75	24.1	9.15
H-76	23.4	9.6
H-77	24.90	9.45
H-78	25.5	10.1
H-79	19.5	8.85
H-80	25.8	9.15

APTT : activated partial thromboplastin time, PT : prothrombin time

Appendix 14-1. Histopathological findings of male rats

INDIVIDUAL DATA OF HISTOPATHOLOGICAL FINDINGS										
STUDY : GT13-00174	SEX : MALE									
GROUP(mg/m ³) : C(0)	1	2	3	4	5	6	7	8	9	10
ANIMAL ID										
Liver	-	-	-	-	-	-	-	-	-	-
Kidney	-	-	-	-	-	-	-	-	-	-
-Basophilic tubule, focal, cortex			±						±	
Adrenal gl.	-	-	-	-	-	-	-	-	-	-
Urinary bladder	-	-	-	-	-	-	-	-	-	-
Spleen	-	-	-	-	-	-	-	-	-	-
Pancreas	-	-	-	-	-	-	-	-	-	-
Thymus	-	-	-	-	-	-	-	-	-	-
Thyroid	-	-	-	-	-	-	-	-	-	-
Parathyroid	-	-	-	-	-	-	-	-	-	-
Trachea	-	-	-	-	-	-	-	-	-	-
Esophagus	-	-	-	-	-	-	-	-	-	-
Tongue	-	-	-	-	-	-	-	-	-	-
Lung	-	-	-	-	-	-	-	-	-	-
-Accumulation, alveolar macrophage, focal, alveolar			±							
Heart	-	-	-	-	-	-	-	-	-	-
Submandibular LN	-	-	-	-	-	-	-	-	-	-
Mesenteric LN	-	-	-	-	-	-	-	-	-	-
Salivary gl. submandibular	-	-	-	-	-	-	-	-	-	-
Salivary gl. sublingual	-	-	-	-	-	-	-	-	-	-
Salivary gl. parotid	-	-	-	-	-	-	-	-	-	-
Stomach	-	-	-	-	-	-	-	-	-	-
Duodenum	-	-	-	-	-	-	-	-	-	-
Ileum	-	-	-	-	-	-	-	-	-	-
Jejunum	-	-	-	-	-	-	-	-	-	-
Cecum	-	-	-	-	-	-	-	-	-	-
Colon	-	-	-	-	-	-	-	-	-	-
Rectum	-	-	-	-	-	-	-	-	-	-
Skin	-	-	-	-	-	-	-	-	-	-
Mammary gl.	-	-	-	-	-	-	-	-	-	-
Eye	-	-	-	-	-	-	-	-	-	-
Optic nerve	-	-	-	-	-	-	-	-	-	-
Harderian gl.	-	-	-	-	-	-	-	-	-	-
Brain	-	-	-	-	-	-	-	-	-	-
Pituitary	-	-	o	-	-	-	-	-	-	-
Femur	-	-	-	-	-	-	-	-	-	-
Spinal cord	-	-	-	-	-	-	-	-	-	-
Skeletal muscle	-	-	-	-	-	-	-	-	-	-
Sciatic nerve	-	-	-	-	-	-	-	-	-	-
Testis	-	-	-	-	-	-	-	-	-	-
Epididymis	-	-	-	-	-	-	-	-	-	-
Prostate	-	-	-	-	-	-	-	-	-	-
Seminal vesicle	-	-	-	-	-	-	-	-	-	-
Coagulating gl.	-	-	-	-	-	-	-	-	-	-
Sternum	-	-	-	-	-	-	-	-	-	-
Nasal cavity	-	-	-	-	-	-	-	-	-	-

Grade) -: Not remarkable, ± : minimal

gl.=gland, LN=lymph node, o: organ omission

Appendix 14-1. Histopathological findings of male rats (Continued)

INDIVIDUAL DATA OF HISTOPATHOLOGICAL FINDINGS										
STUDY : GT13-00174										
SEX : MALE										
ANIMAL ID	31	32	33	34	35	36	37	38	39	40
Liver	-	-	-	-	-	-	-	-	-	-
Kidney	-	-	-	-	-	-	-	-	-	-
-Basophilic tubule, focal, cortex							±			
Adrenal gl.	-	-	-	-	-	-	-	-	-	-
Urinary bladder	-	-	-	-	-	-	-	-	-	-
Spleen	-	-	-	-	-	-	-	-	-	-
Pancreas	-	-	-	-	-	-	-	-	-	-
Thymus	-	-	-	-	-	-	-	-	-	-
Thyroid	-	-	-							
-Ectopic thymus					±		-	±		
Parathyroid	-	-	-	o	-	-	-	-	-	-
Trachea	-	-	-	-	-	-	-	-	-	-
Esophagus	-	-	-	-	-	-	-	-	-	-
Tongue	-	-	-	-	-	-	-	-	-	-
Lung	-	-	-	-	-	-	-	-	-	-
Heart	-	-	-	-	-	-	-	-	-	-
Submandibular LN	-	-	-	-	-	-	-	-	-	-
Mesenteric LN	-	-	-	-	-	-	-	-	-	-
Salivary gl. submandibular	-	-	-	-	-	-	-	-	-	-
Salivary gl. sublingual	-	-	-	-	-	-	-	-	-	-
Salivary gl. parotid	-	-	-	-	-	-	-	-	-	-
Stomach	-	-	-	-	-	-	-	-	-	-
Duodenum	-	-	-	-	-	-	-	-	-	-
Ileum	-	-	-	-	-	-	-	-	-	-
Jejunum	-	-	-	-	-	-	-	-	-	-
Cecum	-	-	-	-	-	-	-	-	-	-
Colon	-	-	-	-	-	-	-	-	-	-
Rectum	-	-	-	-	-	-	-	-	-	-
Skin	-	-	-	-	-	-	-	-	-	-
Mammary gl.	-	-	-	-	-	-	-	-	-	-
Eye	-	-	-	-	-	-	-	-	-	-
Optic nerve	-	-	-	-	-	-	-	-	-	-
Harderian gl.	-	-	-	-	-	-	-	-	-	-
Brain	-	-	-	-	-	-	-	-	-	-
Pituitary	-	-	-	-	-	-	-	-	-	-
Femur	-	-	-	-	-	-	-	-	-	-
Spinal cord	-	-	-	-	-	-	-	-	-	-
Skeletal muscle	-	-	-	-	-	-	-	-	-	-
Sciatic nerve	-	-	-	-	-	-	-	-	-	-
Testis	-	-	-	-	-	-	-	-	-	-
Epididymis	-	-	-	-	-	-	-	-	-	-
Prostate	-	-	-	-	-	-	-	-	-	-
Seminal vesicle	-	-	-	-	-	-	-	-	-	-
Coagulating gl.	-	-	-	-	-	-	-	-	-	-
Sternum	-	-	-	-	-	-	-	-	-	-
Nasal cavity	-	-	-	-	-	-	-	-	-	-

(Grade) -: Not remarkable, ± : minimal

gl=gland, LN=lymph node, o: organ omission

Appendix 14-2. Histopathological findings of female rats

INDIVIDUAL DATA OF HISTOPATHOLOGICAL FINDINGS										
STUDY : GT13-00174										
SEX : FEMALE										
ANIMAL ID	41	42	43	44	45	46	47	48	49	50
Liver	-	-	-	-	-	-	-	-	-	-
Kidney	-			-						
-Mineralization, focal, outer stripe		±	±		±	±	±	±	±	±
Adrenal gl.	-	-	-	-	-	-	-	-	-	-
-Hemorrhage, focal, cortex						±				
Urinary bladder	-	-	-	-	-	-	-	-	-	-
Spleen	-	-	-	-	-	-	-	-	-	-
Pancreas	-	-	-	o	o	-	-	-	-	-
Thymus	-	-	-	-	-	-	-	-	-	-
Thyroid	-	-	-	-	-	-	-	-	-	-
-Ultimobranchial cyst						±				±
Parathyroid	-	-	-	-	-	-	o	-	-	-
Trachea	-	-	-	-	-	-	-	-	-	-
Esophagus	-	-	-	-	-	-	-	-	-	-
Tongue	-	-	-	-	-	-	-	-	-	-
Lung										
-Accumulation, alveolar macrophage, focal, subpleural	±	±								±
-Bronchiolization, focal										±
Heart	-	-	-	-	-	-	-	-	-	-
Submandibular LN	-	-	-	-	-	-	-	-	-	-
Mesenteric LN	-	-	-	-	-	-	-	-	-	-
Salivary gl. submandibular	-	-	-	-	-	-	-	-	-	-
Salivary gl. sublingual	-	-	-	-	-	-	-	-	-	-
Salivary gl. parotid	-	-	-	-	-	-	-	-	-	-
Stomach	-	-	-	-	-	-	-	-	-	-
Duodenum	-	-	-	o	o	-	-	-	-	-
Ileum	-	-	-	-	-	-	-	-	-	-
Jejunum	-	-	-	-	-	-	-	-	-	-
Cecum	-	-	-	-	-	-	-	-	-	-
Colon	-	-	-	-	-	-	-	-	-	-
Rectum	-	-	-	-	-	-	-	-	-	-
Skin	-	-	-	-	-	-	-	-	-	-
Mammary gl.	-	-	-	-	-	-	-	-	-	-
Eye	-	-	-	-	-	-	-	-	-	-
-Lenticular degeneration, unilateral							++			
-Hyperplasia, lens epithelial, unilateral							±			
-Complete loss, retinal layers, unilateral							++			
Optic nerve	-	o	-	-	-	-	-	-	-	-
Harderian gl.	-	-	-	-	-	-	-	-	-	-
Brain	-	-	-	-	-	-	-	-	-	-
Pituitary	-	-	-	-	-	-	-	-	-	-
Femur	-	-	-	-	-	-	-	-	-	-
Spinal cord	-	-	-	-	-	-	-	-	-	-
Skeletal muscle	-	-	-	-	-	-	-	-	-	-
Sciatic nerve	-	-	-	-	-	-	-	-	-	-
Ovary	-	-	-	-	-	-	-	-	-	-
Uterus	-	-	-	-	-	-	-	-	-	-
Vagina	-	-	-	-	-	-	-	-	-	-
Sternum	-	-	-	-	-	-	-	-	-	-
Nasal cavity	-	-	-	-	-	-	-	-	-	-

Grade) -: Not remarkable, ±: minimal, +: mild, ++: moderate

gl.=gland, LN=lymph node, o: organ omission

Appendix 14-2. Histopathological findings of female rats (Continued)

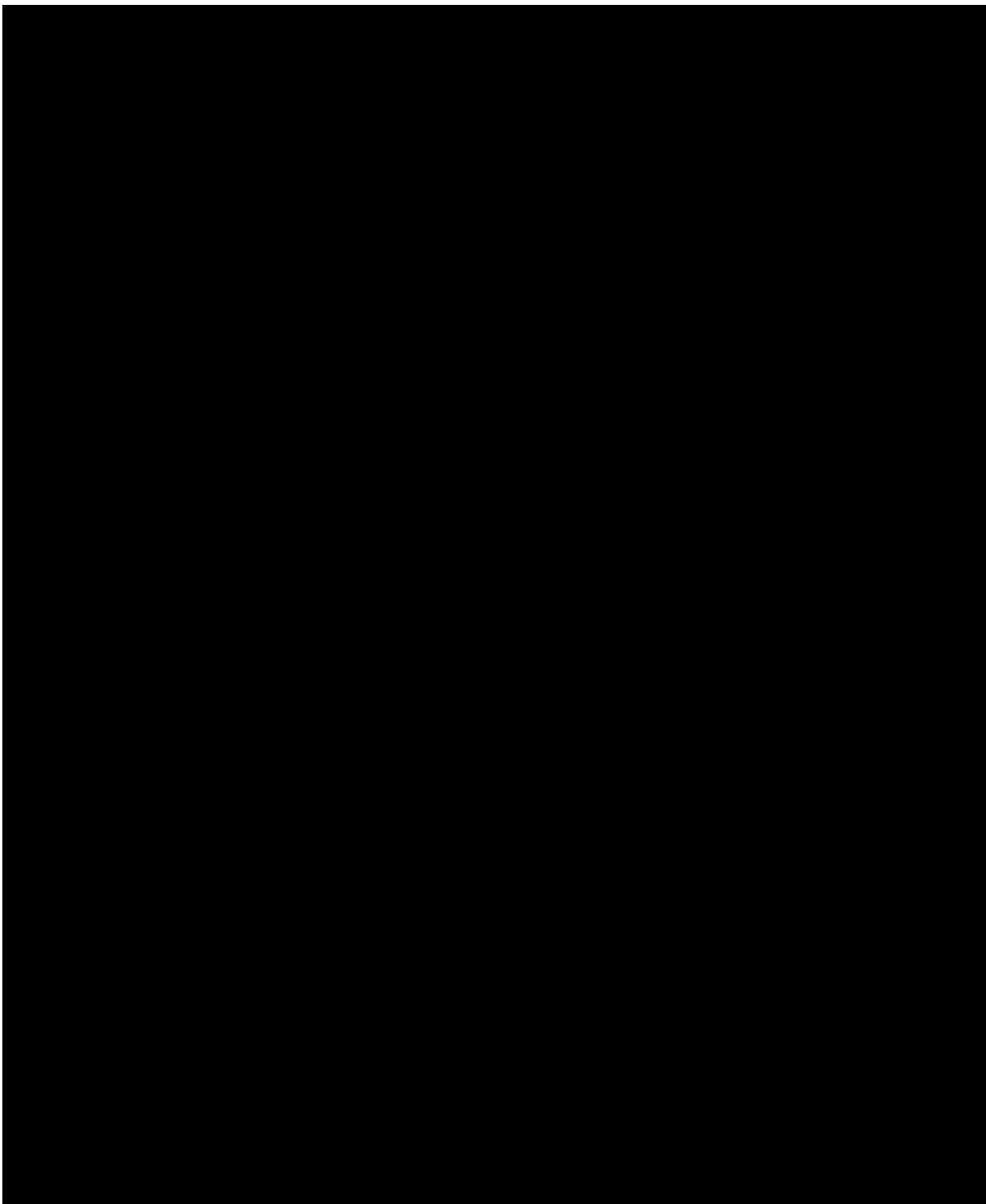
INDIVIDUAL DATA OF HISTOPATHOLOGICAL FINDINGS										
STUDY : GT13-00174										SEX : FEMALE
ANIMAL ID	71	72	73	74	75	76	77	78	79	80
Liver	-	-	-	-	-	-	-	-	-	-
Kidney	-	-	-	-	-	-	-	-	-	-
-Mineralization, focal, outer stripe	±	±	±	±	±	±	±	±	±	±
Adrenal gl.	-	-	-	-	-	-	-	-	-	-
Urinary bladder	-	-	-	-	-	-	-	-	-	-
Spleen	-	-	-	-	-	-	-	-	-	-
Pancreas	-	-	-	-	-	-	-	-	-	-
Thymus	-	-	-	-	-	-	-	-	-	-
Thyroid	-	-	-	-	-	-	-	-	-	-
Parathyroid	-	-	-	-	-	-	-	-	-	-
Trachea	-	-	-	-	-	-	-	-	-	-
Esophagus	-	-	-	-	-	-	-	-	-	-
Tongue	-	-	-	-	-	-	-	-	-	-
Lung	-	-	-	-	-	-	-	-	-	-
-Accumulation, alveolar macrophage, focal, alveolar	±									
-Accumulation, alveolar macrophage, focal, alveolar and subpleural		±								
-Accumulation, alveolar macrophage, focal, subpleural						±	±			
Heart	-	-	-	-	-	-	-	-	-	-
Submandibular LN	-	-	-	-	-	-	-	-	-	-
Mesenteric LN	-	-	-	-	-	-	-	-	-	-
Salivary gl. submandibular	-	-	-	-	-	-	-	-	-	-
Salivary gl. sublingual	-	-	-	-	-	-	-	-	-	-
Salivary gl. parotid	-	-	-	-	-	-	-	-	-	-
Stomach	-	-	-	-	-	-	-	-	-	-
Duodenum	-	-	-	-	-	-	-	-	-	-
Ileum	-	-	-	-	-	-	-	-	-	-
Jejunum	-	-	-	-	-	-	-	-	-	-
Cecum	-	-	-	-	-	-	-	-	-	-
Colon	-	-	-	-	-	-	-	-	-	-
Rectum	-	-	-	-	-	-	-	-	-	-
Skin	-	-	-	-	-	-	-	-	-	-
Mammary gl.	-	-	-	-	-	-	-	-	-	-
Eye	-	-	-	-	-	-	-	-	-	-
Optic nerve	-	-	-	-	-	-	-	-	-	-
Harderian gl.	-	-	-	-	-	-	-	-	-	-
Brain	-	-	-	-	-	-	-	-	-	-
Pituitary	-	-	-	-	-	-	-	-	-	-
Femur	-	-	-	-	-	-	-	-	-	-
Spinal cord	-	-	-	-	o	-	-	-	-	-
Skeletal muscle	-	-	-	-	-	-	-	-	-	-
Sciatic nerve	-	-	-	-	-	-	-	-	-	-
Ovary	-	-	-	-	-	-	-	-	-	-
Uterus	-	-	-	-	-	-	-	-	-	-
Vagina	-	-	-	-	-	-	-	-	-	-
Sternum	-	-	-	-	-	-	-	-	-	-
Nasal cavity	-	-	-	-	-	-	-	-	-	-

Grade) -: Not remarkable, ± : minimal

gl=gland, LN=lymph node, o: organ omission

10. ANNEXES

Annex 1. Test substance data sheet



Annex 2. Animals diagnostic report

Japan Etc., Inc.

S. Takagi
Shouhei Takagi, D.V.M.
Director, Department of
Laboratory Animal Medicine

the way to trust **KCL** Korea Conformity Laboratories

Annex 2. Animals diagnostic report (continued)

CERTIFICATE OF STRAIN

We hereby certify the strain of the animals and their background as follows

Place of birth :	Japan SLC, Inc., Itaya Production Facility		
Purchaser :	May 29, 2013		
Shipping date and flight number :	As attached sheet		
Monitoring result :			

Details	Inbred Rat			
	GKStrc	Fau/Nic	HWStrc	LEW/SaNSlc
Origin & History ⇒ 1989, SLC (F7) 2013, (F14+34)	Tohoku University School ⇒ 1989, SLC (F7) 2013, (F138+72)	NIH ⇒ 1986, Jax ⇒ 1980, SLC (F138)	Yag Memorial Park, Japan ⇒ 1983, SLC 2013, (F14+36)	NIH ⇒ 1984, SLC (F14) 2013, (F14+36)

Japan SLC, Inc.

S. Kocher
Small Animal IVW M
Director, Department of
Laboratory Animal Medicine

Annex 2. Animals diagnostic report (continued)

Genetic profiles for biochemical and immunogenetic markers of inbred rat strains

— July, 2011 to December, 2011 —

Strain	Chromosome No.	1	2	3	4	5	6	7	13	14	19	19	19	19	20
	Locus	Rsp	AmpL	Cod	Start	End	Gen	Gen	Fm	GeC	ExR	ExS	ExM	RTLA*	
ACR/Slc	b	b	a	a	b	b	a	b	a	a	a	b	b	a	
BHSS/Slc	a	b	a	b	b	b	a	a	a	a	a	b	a	a	
DA/Slc	b	a	a	a	a	b	a	b	a	a	a	b	a	a	
DB/Slc	b	b	a	a	a	b	a	b	a	b	d	c	b	i	
DSD/Slc	b	a	a	a	a	b	a	b	a	b	d	c	b	i	
HHRR/Slc	b	a	a	a	a	b	a	b	a	b	d	c	b	i	
F344/Slc	a	a	a	a	a	b	a	b	a	a	a	a	a	a	
OK/Jc	a	a	a	a	a	a	a	a	a	a	a	b	a	a	
HWY/Slc	b	a	a	a	b	b	b	b	a	a	a	a	b	a	
LEW/SabSlc	b	a	a	a	b	b	a	b	a	a	a	d	b	i	
WBK/KitobSlc	a	a	a	a	b	b	a	b	a	a	a	b	a	a	
WKBAH/HkrosSlc	b	a	b	a	b	a	a	a	a	a	a	b	a	a	

RTLA* : tested by Revision of Genetics, CLAS Monitoring Center



Mario Masui, Ph.D.
Manager, Quality Control Department
Biotechnical Center, Japan SLC, Inc.

Annex 3. Certification of Environment for animal care room

Certification of Environment for animal breeding room

Study No.	GT13-00174
Title	Subacute Inhalation Toxicity : 28-Day Study of MWCNT in Fisher 344 rats(Acclimation period)
SPF Room No.	Inhalation toxicity animal room
Period of animal Breeding	2013-05-30 ~ 2013-06-05

Breeding environment condition

Section	Range of SOP	Survey value	Remark
Temperature	22±3 °C	21.2±0.6 °C	
Humidity	50±20 %RH	55.9±3.4% RH	
Luminous intensity	150~300 Lux	276 Lux	
Noise	60 db less than	48.1 dB	
Ammonia	15 ppm less than	5 ppm less than	

It is authenticated that there is no change of environment which digresses from the above established value for more than 2 hours during the test period.

Facility management director Dong-Seok Beck



2013-09-10

Annex 3. Certification of Environment for animal care room (continued)

Certification of Environment for animal breeding room			
Study No.	GT13-00174		
Title	Subacute Inhalation Toxicity : 28-Day Study of MWCNT in Fisher 344 rats(Exposure period)		
SPF Room No.	Inhalation toxicity animal room		
Period of animal Breeding	2013-06-05 ~ 2013-07-03		
Breeding environment condition			
Section	Range of SOP	Survey value	Remark
Temperature	22±3 °C	22.9±2.0 °C	
Humidity	50±20 %RH	48.7±3.2% RH	
Luminous intensity	150~300 Lux	272 Lux	
Noise	60 db less than	55.1 dB	
Ammonia	15 ppm less than	5 ppm less than	
It is authenticated that there is no change of environment which digresses from the above established value for more than 2 hours during the test period.			
Facility management director		Dong-Seok Beck	
2013-09-10			

Annex 4. Laboratory animal diet certification report

Laboratory Diet Certification Report

Teklad Certified Irradiated Global 18% Protein Rodent Diet

2918C

The following data is a consolidation of results obtained from one or more independent testing laboratories. The actual laboratory results are available upon request.

Kurt Schaefer
Quality Assurance Coordinator, Technical Services
Enviro-Medical and Services
Harlan Laboratories, Inc.
I have reviewed this document:
2013.03.20 09:52:32
-05'00'

Lot Number 2918C-030413MA

Date of Manufacture 03/04/13

Report Date 03/19/13

Proximate Analysis

Analysis	Result (%)
Protein	18.20
Fat	8.17
Fiber	3.82
Moisture	10.50
Ash	5.88
Calcium	1.01
Phosphorus	0.77

Feed Contaminant Screen

Analysis	Result	Units	Established Maximum Concentration
Heavy Metals			
Arsenic	0.12	ppm	1.00
Cadmium	< 0.10	ppm	0.50
Lead	< 0.20	ppm	1.50
Mercury	< 0.06	ppm	0.20
Selenium	0.34	ppm	0.50
Myotoxin			
Aflatoxin B1, B2, G1, G2	< 5.00	ppb	< 5.00
Chlorinated Hydrocarbons			
Aldrin	< 0.01	ppm	0.03
Lindane	< 0.01	ppm	0.05
Chlordane	< 0.01	ppm	0.05
DDT & related substances	< 0.03	ppm	0.15
Dieldrin	< 0.02	ppm	0.03
Ergochin	< 0.02	ppm	0.03
Heptachlor	< 0.01	ppm	0.03
Heptachlor Epoxide	< 0.01	ppm	0.03
Toxaphene	< 0.10	ppm	0.15
PCB's	< 0.10	ppm	0.15
a-BHC	< 0.01	ppm	0.05
b-BHC	< 0.01	ppm	0.05
o-BHC	< 0.01	ppm	0.05
Hexachlorobenzene	< 0.01	ppm	0.03
Mirex	< 0.01	ppm	0.02
Methoxychlor	< 0.06	ppm	0.50
Organophosphates			
Trimer	< 0.16	ppm	0.50
Diazinon	< 0.14	ppm	0.50
Disulfoton	< 0.16	ppm	0.50
Methyl Parathion	< 0.14	ppm	0.50
Malathion	< 0.14	ppm	0.50
Parathion	< 0.12	ppm	0.50
Thiodan	< 0.02	ppm	0.50
Ethion	< 0.14	ppm	0.50
Triticon	< 0.16	ppm	0.50

P.O. Box 44220 Madison, WI 53744-0220 800-483-5523 • www.harlan.com

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Annex 5. Certification of tap water analysis report

TEST REPORT

1. No : PC13-00284

Reissuance (R1)

2. Client

Date : 2013.4.11

○ Name : Korea Conformity Laboratories(Incheon)

○ Address : #7-44, Songdo-dong, Yeonsu-gu, Incheon, Korea

○ Date of Receipt : Mar. 14, 2013

○ Date of Issued : Apr. 17, 2013

3. Use of Report : Submission

4. Test Sample : Drinking Water (Animal room)

5. Method :

(1) Notification No.2012-143 of the Ministry
of Environment.

Affirmation	Tested By Name : Hyoung jun Seok <i>Seok.</i>	Technical Manager Name : Sang Cheul Lee <i>S. C. Lee</i>
Our report apply only to the standards or procedures identified and to the sample(s) tested unless otherwise specified. The test results are not indicative of representative of the qualities of the qualities of the lot from which the sample was taken or if apparently identical or similar products.		

Korea Conformity Laboratories

President Song Jae Bin

Jae Bin Song

Address : 704-932 277-5, Jukjeon-Dong, Dalseo-Gu, Daegu, 704-932, Korea 82-53-557-6681

Result Inquiry : Environmental Testing Center 82-2-2102-2598

- Page 1 of 3 -

QP-20-01-07(2)

Annex 5. Certification of tap water analysis report (continued)

TEST REPORT

No : PC13-00284

6. Test Results

1) Drinking Water (Animal room)

Test Item(s)	Unit	Limitation(s)	LOQ	Test method used	Test Result(s)
Total colony counts	CFU/mL	Less than 100	0	(1)	0
Total coliforms	-/(100mL)	Not detected	-	(1)	Not detected
E-Coli	-/(100mL)	Not detected	-	(1)	Not detected
Lead	mg/L	Less than 0.01	0.005	(1)	Not detected
Arsenic	mg/L	Less than 0.01	0.005	(1)	Not detected
Selenium	mg/L	Less than 0.01	0.005	(1)	Not detected
Cadmium	mg/L	Less than 0.005	0.002	(1)	Not detected
Boron	mg/L	Less than 1.0	0.01	(1)	Not detected
Copper	mg/L	Less than 1.0	0.008	(1)	Not detected
Zinc	mg/L	Less than 3.0	0.002	(1)	0.003
Iron	mg/L	Less than 0.3	0.05	(1)	Not detected
Manganese	mg/L	Less than 0.3	0.005	(1)	Not detected
Aluminium	mg/L	Less than 0.2	0.02	(1)	Not detected
Mercury	mg/L	Less than 0.001	0.001	(1)	Not detected
Fluoride	mg/L	Less than 1.5	0.15	(1)	Not detected
Nitrate nitrogen	mg/L	Less than 10	0.1	(1)	0.2
Chloride	mg/L	Less than 250	0.4	(1)	0.6
Sulfate	mg/L	Less than 200	2	(1)	Not detected
Diazinon	mg/L	Less than 0.02	0.0005	(1)	Not detected
Parathion	mg/L	Less than 0.06	0.0005	(1)	Not detected
Fenitrothion	mg/L	Less than 0.04	0.0005	(1)	Not detected
Dichloromethane	mg/L	Less than 0.02	0.002	(1)	Not detected
1,1,1-Trichloroethane	mg/L	Less than 0.1	0.001	(1)	Not detected
Benzene	mg/L	Less than 0.01	0.001	(1)	Not detected
Toluene	mg/L	Less than 0.7	0.001	(1)	Not detected
Ethylbenzene	mg/L	Less than 0.3	0.001	(1)	Not detected
Xylene	mg/L	Less than 0.5	0.001	(1)	Not detected
1,1-Dichloroethylene	mg/L	Less than 0.03	0.001	(1)	Not detected
Tetrachloroethane	mg/L	Less than 0.002	0.001	(1)	Not detected
Tetrachloroethylene	mg/L	Less than 0.01	0.001	(1)	Not detected

Annex 5. Certification of tap water analysis report (continued)

TEST REPORT

No. : PC13-00284

6. Test Results

1) Drinking Water (Animal room)

Test Item(s)	Unit	Limitation(s)	LOQ	Test method used	Test Result(s)
Trichloroethylene	mg/L	Less than 0.03	0.001	(1)	Not detected
1,2-Dibromo-3-Chloropropane	mg/L	Less than 0.003	0.001	(1)	Not detected
Carbaryl	mg/L	Less than 0.07	0.005	(1)	Not detected
Chromium	mg/L	Less than 0.05	0.03	(1)	Not detected
Ammonium Nitrogen	mg/L	Less than 0.5	0.01	(1)	Not detected
Phenol	mg/L	Less than 0.005	0.005	(1)	Not detected
Alkyl Benzene Sulfate	mg/L	Less than 0.5	0.1	(1)	Not detected
Cyanide	mg/L	Less than 0.01	0.01	(1)	Not detected
pH	-	5.8 ~ 8.5	-	(1)	6.2
Turbidity	NTU	Less than 1	0.02	(1)	0.11
Color	degree	Less than 5	1	(1)	Not detected
Taste	-	Free	-	(1)	Pass
Odor	-	Free	-	(1)	Pass
Hardness	mg/L	Less than 300	1	(1)	Not detected
Consumption of KMnO ₄	mg/L	Less than 10	0.3	(1)	0.6
Total solids	mg/L	Less than 500	2	(1)	Not detected

— End of Report —

Annex 6. KCL GLP certification of NIER

지정번호 (Certification No.)		화학물질 유해성 시험기관 지정서 GLP Certificate	
①	시험기관 Test Facility Name	한국생활환경시험연구원 안전성평가본부 Korea Environment and Merchandise Testing Institute Bio-Safety Evaluation Headquarters	
	소재지 Address	인천광역시 연수구 송도동 7-44 7-44, Songdo-Dong, Yeonsu-Gu, Incheon, 406-840, Korea	
③	대표자 President	김창로 Chang-Ro Kim	
	운영책임자 Test Facility Management	유일재 Il-Je Yu	
⑤	시험의 범위 Test Scope	<ul style="list-style-type: none"> - 금성경구독성시험, 유전독성시험(복귀률연변이시험, 염색체이상시험, 소핵시험). (유효기간 : 2006년 3월 31일부터). 끝. - 금성피부자극성 및 부식성시험, 금성안자극성 및 부식성시험, 금성흡입독성시험. (유효기간 : 2007년 4월 17일부터). 끝. - 아금성독성시험, 피부감작성시험. (유효기간 : 2008년 8월 25일부터). 끝. <ul style="list-style-type: none"> - Acute oral toxicity, Genetic Toxicity(Ames test, Chromosome abberation test, Micronucleus test) (Validation : since Mar. 31, 2006). - Acute dermal irritation/corrosion, Acute eye irritation/ corrosion, Acute inhalation toxicity (Validation : since Apr. 17, 2007). - Subchronic toxicity, Skin sensitization (Validation : since Aug. 25, 2008). 	
<p>「유해화학물질관리법」 제14조, 같은 법 시행령 제12조 및 같은 법 시행규칙 제10조제2항에 따라 화학물질 유해성 시험기관(GLP시험기관)으로 지정합니다.</p> <p>It is hereby certified that the test facility was inspected by the national compliance monitoring authority regarding compliance with the Principles of Good Laboratory Practice.</p> <p>Issue date 2008년(year) 8월(month) 25일(date)</p> <p>국립환경과학원장 </p> <p>President, National Institute of Environmental Research</p>			

Annex 6. KCL GLP certification of NIER (continued)

(뒤 쪽)-1

<변경사항>

일자	내용	확인
2009. 5. 20	운영책임자 변경 : 유 일 재 (Il-Je Yu)에서 송 성 썩 (Kyung-Seuk Song)으로 변경	확인
2009. 11. 16 (수정)	시험의 범위 : 유행성피토신 시험, 어류급성독성시험 (유효기간 : 2009년 11월 16일부터) 끝,	확인
" (영문)	Test Scope : Acute dermal toxicity, Fish acute toxicity (Validation : Since Nov. 16, 2009).	확인
2010. 8. 2	대표자 변경 : 김 창 로 (Chang-ro Kim)에서 오태식 (Taeshik Oh)로 변경	G L P 확인
2010. 8. 2	기관별 변경 : 한국인증연합환경시험연구원 바이오융합부문	G L P 확인
2011. 9. 9	운영책임자 변경 : 송 성 썩 (Kyung-Seuk Song)에서 이 전 규 (Jin Kyu Lee)으로 변경	G L P 확인

<처분사항>

일자	내용	확인

<참고사항>

일자	내용	확인
2010. 12.	정기시추평가 결과, GLP규정을 준수하고 있음 (GLP Compliance)	G L P 확인
2012. 7. 2	정기시추평가 결과, GLP규정을 준수하고 있음 (GLP Compliance)	G L P 확인

Annex 6. KCL GLP certification of NIER (continued)

화학물질유해성시험기관 지정서
제2008-4호

(뒤 쪽)-2

<변경사항>

일자	내용	확인
2011. 9. 9	기관명변경: "한국건설생활환경시험연구원 바이오융합단"으로 변경 (Bioconvergence Technology Department, Korea Conformity Laboratories)	G L P 확인
2011. 11. 3	대표자 변경 : 오태석 (Taeshik Oh)에서 송재빈 (Jae Bin Song)으로 변경	G L P 확인
2012. 7. 2	기관명변경 : "한국건설생활환경시험연구원 바이오융합단"로 변경 (Bioconvergence Technology Laboratory, Korea Conformity Laboratories)	G L P 확인
2012. 7. 2	시험의 범위 : 물체류동 흐름시험, 조류장장구제시험 [Test Scope: Daphnia sp. acute toxicity, Algae: growth inhibition (since July, 2, 2012)]	G L P 확인

<처분사항>

일자	내용	확인

<참고사항>

일자	내용	확인

Annex 7. Quality assurance statement-Original

신뢰성 보증 확인서

시험번호 : GT13-00174

시험명 : Fisher 344 랫드를 이용한 MWCNT의 28일 아급성 흡입독성시험

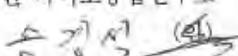
이 보고서에 기술된 시험을 독립적으로 아래와 같이 시험과정 단계별로 점검하였으며 각 점검결과를 표준작업지침서에 따라 시험책임자와 운영책임자에게 통보 및 보고하였다.

본 시험은 국립환경과학원고시 제2013-02호(2013년 01월 09일)의 '화학물질 유해성 시험방법', 국립환경과학원 고시 제2013-1호(2013년 01월 09일) '화학물질 유해성시험연구기관 지정 및 관리기준' 및 OECD Guidelines for the Testing of Chemical No. 412 'Subacute Inhalation Toxicity: 28-Day Study'(Adopted 7th Sep, 2009)에 따라 수행되었으며, 보고서의 방법 및 결과의 기술이 시험의 실시과정에서 발생한 시험기초자료를 바탕으로 정확히 반영되었음을 확인하였다.

점검 내용	설시일	시험책임자에게 통보일	운영책임자에게 보고일
시험계획서 점검	2013. 05. 23	2013. 05. 23	2013. 05. 23
동물입수	2013. 05. 30	2013. 05. 30	2013. 05. 30
시험물질 및 대조물질	2013. 05. 30	2013. 05. 30	2013. 05. 30
시험물질조제	2013. 06. 11 2013. 06. 25	2013. 06. 11 2013. 06. 25	2013. 06. 11 2013. 06. 25
동물사육 및 투여	2013. 06. 11 2013. 06. 25	2013. 06. 11 2013. 06. 25	2013. 06. 11 2013. 06. 25
증상관찰 및 측정	2013. 06. 11 2013. 06. 25	2013. 06. 11 2013. 06. 25	2013. 06. 11 2013. 06. 25
안검사 및 뇨검사	2013. 06. 30	2013. 06. 30	2013. 06. 30
부검 및 임상병리	2013. 07. 03 2013. 07. 04	2013. 07. 03 2013. 07. 04	2013. 07. 03 2013. 07. 04
검체제작 및 검정	2013. 07. 22 2013. 08. 12	2013. 07. 22 2013. 08. 12	2013. 07. 22 2013. 08. 16
시험기초자료 점검	2013. 10. 28	2013. 10. 28	2013. 10. 28
최종보고서 점검	2013. 10. 28	2013. 10. 28	2013. 10. 28

한국건설생활환경시험연구원 바이오융합연구소

신뢰성보증책임자



2013년 10 월 28 일



the way to trust



Korea Conformity Laboratories

Annex 8. Study personnel-Original

시험관계자서명

주 시험담당자

성재혁

주 시험담당자

날짜

2013. 10. 28

시험물질 조제

성재혁

시험물질 조제분석 책임자

날짜

2013. 10. 28

동물관리

백민원

동물관리 책임자

날짜

2013. 10. 28

부검 및 병리

김혜진

병리 책임자

날짜

2013. 10. 28

자료보관

김효동

자료보관 책임자

날짜

2013. 10. 28